INFERENTIAL STATISTICS ON COVID-19

By

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Inferential Statistics on COVID-19

Is there a relationship between corona affected population and corona death population?

Inferential Statistics on COVID-19

- The purpose of the study is to determine if there is a relationship between the rate of affected patients of Corona and the rate of deaths by Corona attack as studied by Correlation and Regression analysis.
- Correlation measures the strength of the association between variables like rate of affected patients and rate of deaths by corona.
- Regression quantifies the association. It should only be used if one of the variables is thought to precede or cause the other
- Data were collected from the Corona affected countries like America, Italy, Spain, Iran, France, England, India, Pakistan and China and total global population.

Inferential Statistics on COVID-19

GLOBAL POPULATION

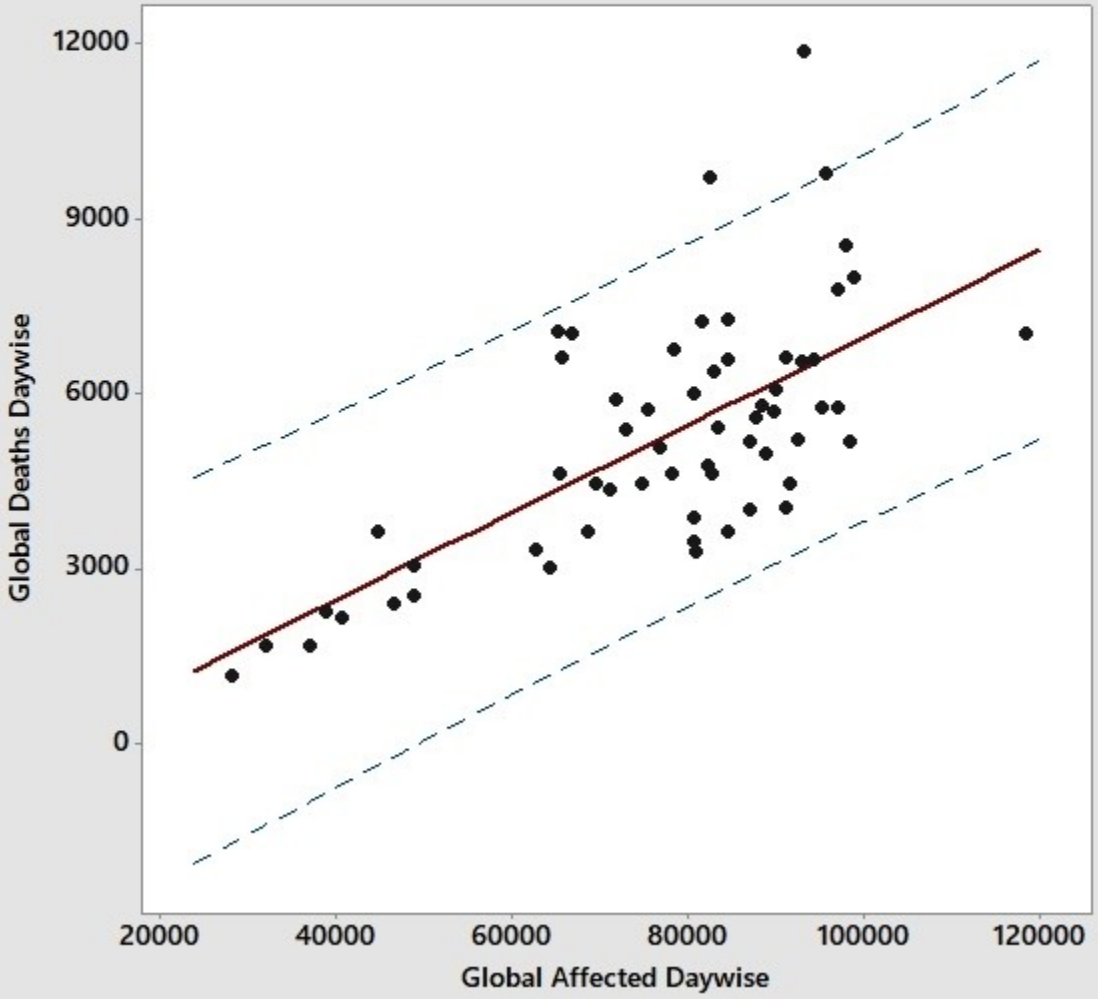
Regression for Global Deaths Daywise vs Global Affected Daywise

Prediction Report

Y: Global Deaths Daywise
X: Global Affected Daywise

Prediction Plot

The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.

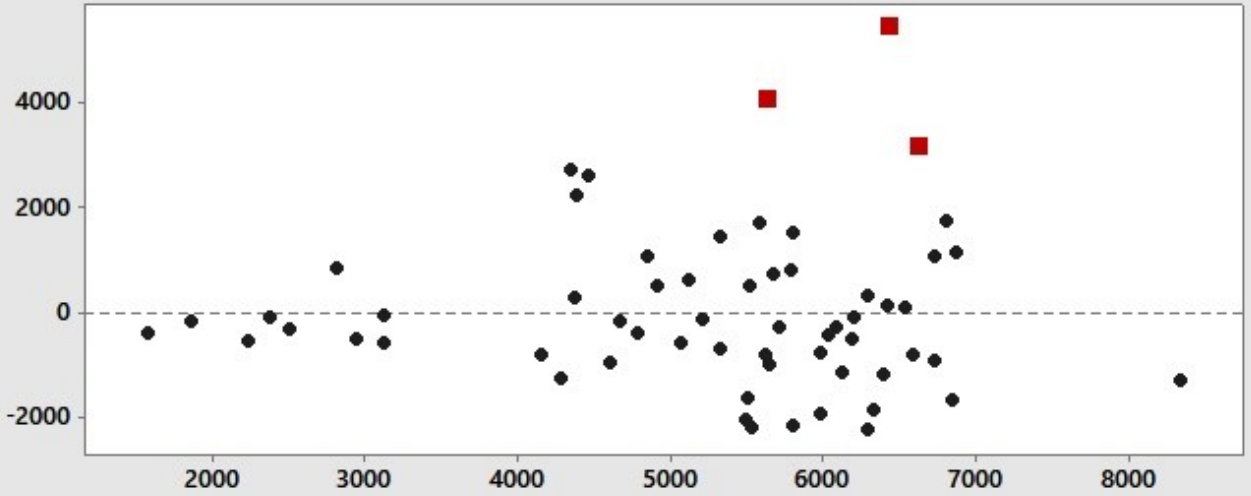


X	Predicted Y	95% PI
24000	1242.0	(-2068.3, 4552.3)
28000	1543.0	(-1739.0, 4825.0)
32000	1843.9	(-1411.7, 5099.6)
36000	2144.9	(-1086.5, 5376.3)
40000	2445.9	(-763.33, 5655.1)
44000	2746.8	(-442.32, 5936.0)
48000	3047.8	(-123.49, 6219.0)
52000	3348.7	(193.13, 6504.3)
56000	3649.7	(507.51, 6791.9)
60000	3950.6	(819.62, 7081.7)
64000	4251.6	(1129.4, 7373.8)
68000	4552.6	(1436.9, 7668.2)
72000	4853.5	(1742.1, 7965.0)
76000	5154.5	(2044.9, 8264.1)
80000	5455.4	(2345.3, 8565.5)
84000	5756.4	(2643.5, 8869.3)
88000	6057.4	(2939.3, 9175.4)
92000	6358.3	(3232.7, 9483.9)
96000	6659.3	(3523.9, 9794.7)
100000	6960.2	(3812.7, 10108)
104000	7261.2	(4099.3, 10423)
108000	7562.1	(4383.7, 10741)
112000	7863.1	(4665.9, 11060)
116000	8164.1	(4945.9, 11382)
120000	8465.0	(5223.8, 11706)

Regression for Global Deaths Daywise vs Global Affected Daywise
Diagnostic Report

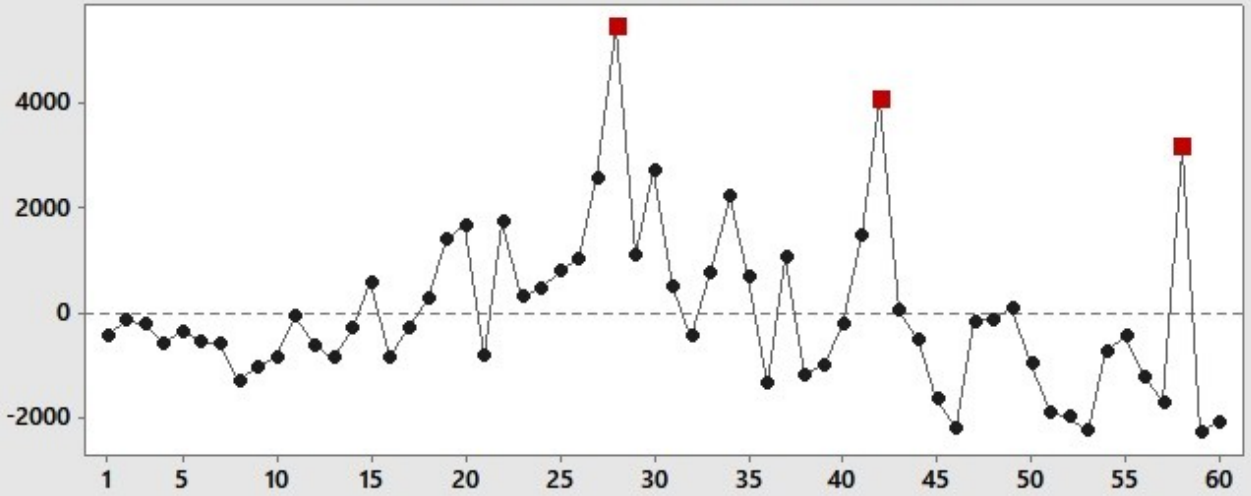
Residuals vs Fitted Values

Look for nonrandom patterns and large residuals.

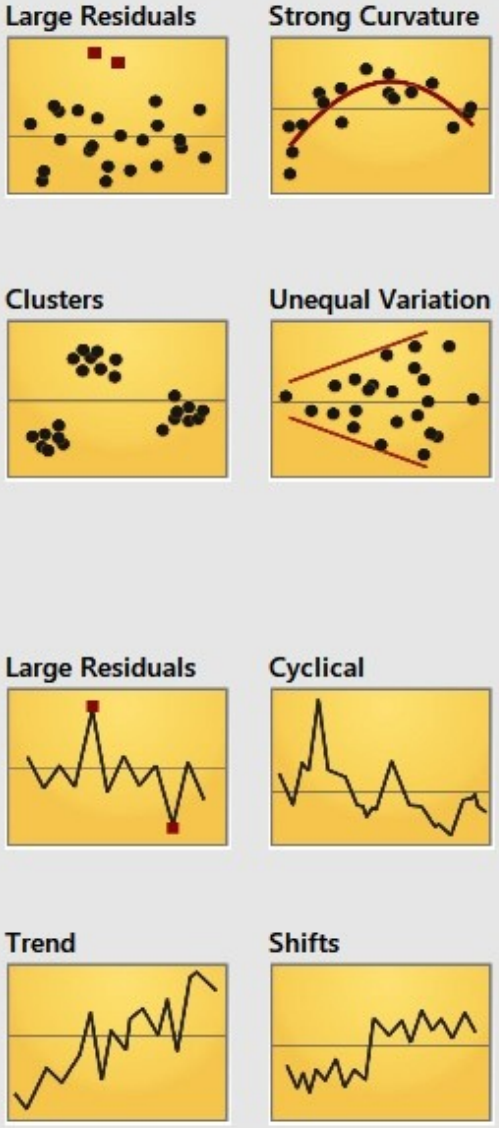


Residuals vs Observation Order

Look for nonrandom patterns and large residuals.



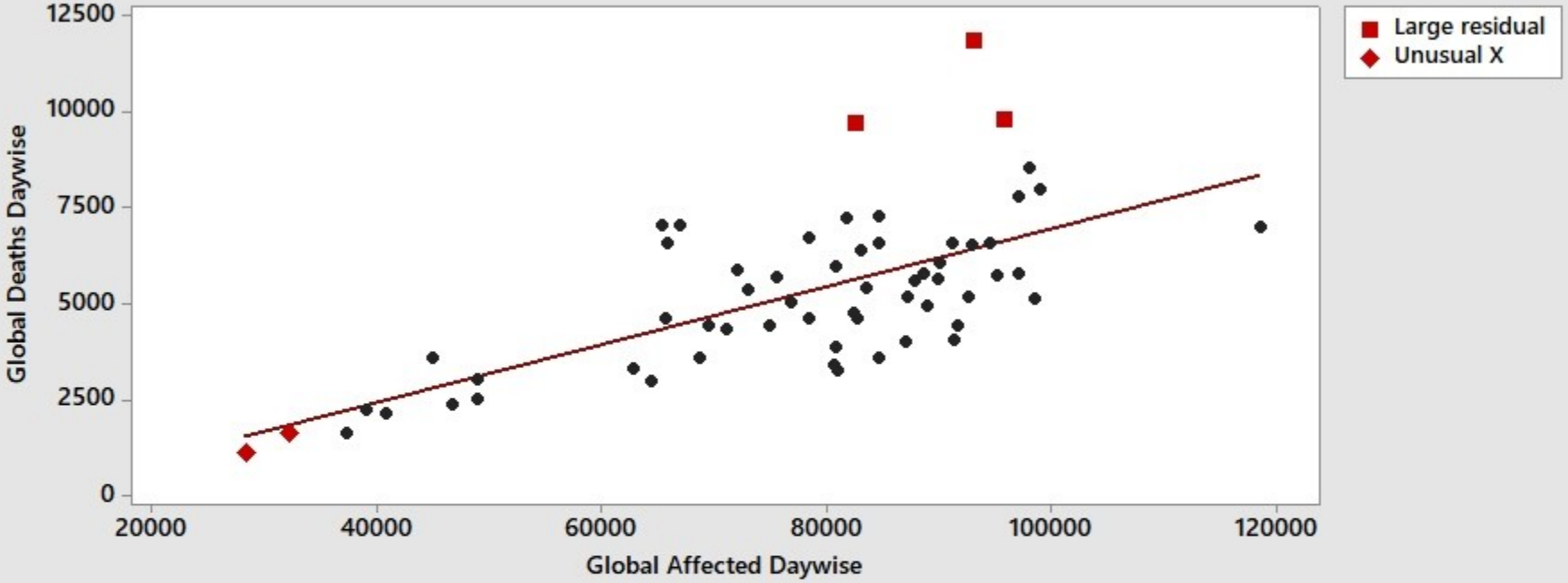
Look for these patterns:



Regression for Global Deaths Daywise vs Global Affected Daywise
Model Selection Report

Y: Global Deaths Daywise
X: Global Affected Daywise

Fitted Line Plot for Linear Model
Y = - 563.7 + 0.07524 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	45.24%	44.80%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.062
P-value, quadratic term	—	0.465
Residual standard deviation	1540.630	1546.767

** Statistically significant ($p < 0.05$)*

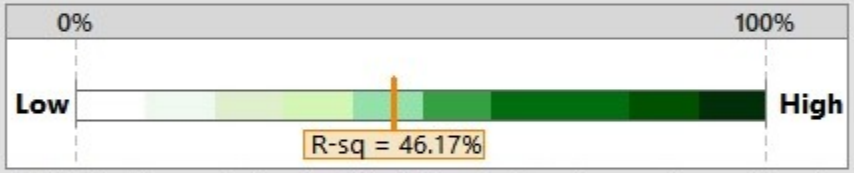
Regression for Global Deaths Daywise vs Global Affected Daywise
Summary Report

Y: Global Deaths Daywise
X: Global Affected Daywise

Is there a relationship between Y and X?

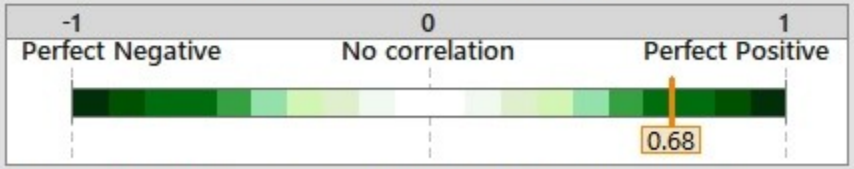
The relationship between Global Deaths Daywise and Global Affected Daywise is statistically significant (p < 0.05).

% of variation explained by the model



46.17% of the variation in Global Deaths Daywise can be explained by the regression model.

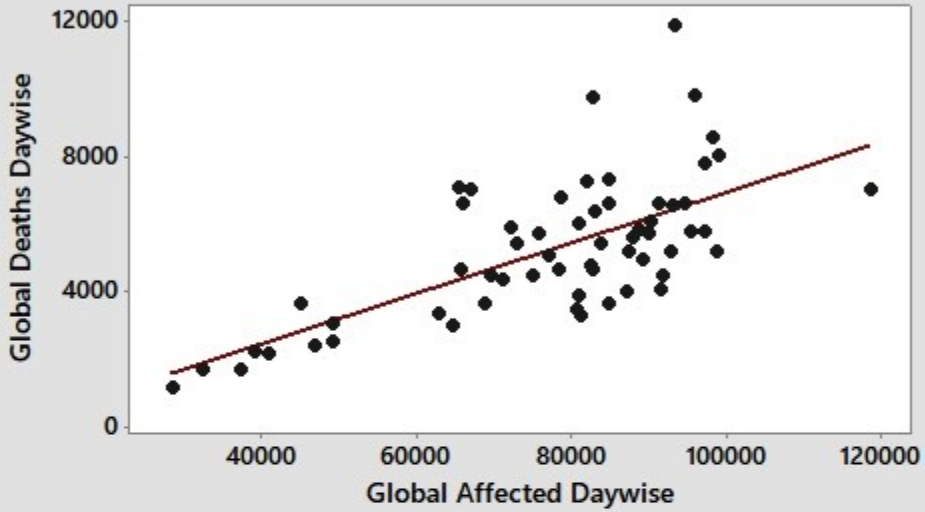
Correlation between Y and X



The positive correlation (r = 0.68) indicates that when Global Affected Daywise increases, Global Deaths Daywise also tends to increase.

Fitted Line Plot for Linear Model

Y = - 563.7 + 0.07524 X



Comments

The fitted equation for the linear model that describes the relationship between Y and X is:

Y = - 563.7 + 0.07524 X

If the model fits the data well, this equation can be used to predict Global Deaths Daywise for a value of Global Affected Daywise, or find the settings for Global Affected Daywise that correspond to a desired value or range of values for Global Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

AMERICA

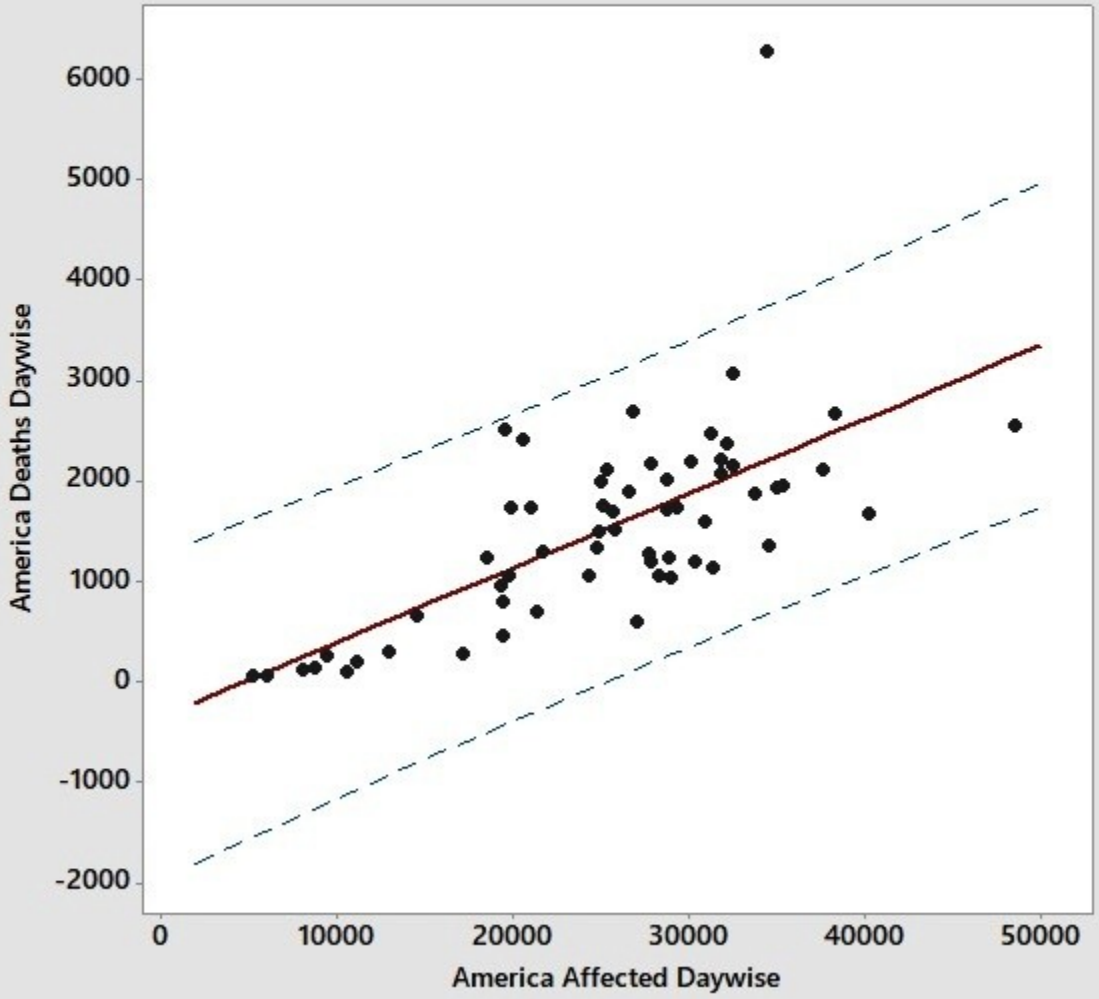
Regression for America Deaths Daywise vs America Affected Daywise

Prediction Report

Y: America Deaths Daywise
X: America Affected Daywise

Prediction Plot

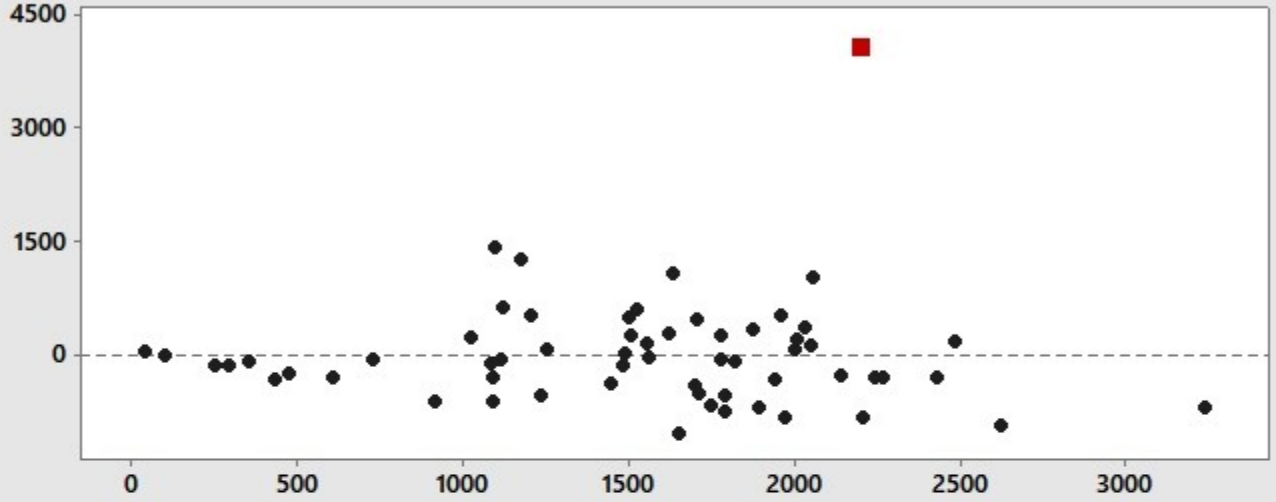
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



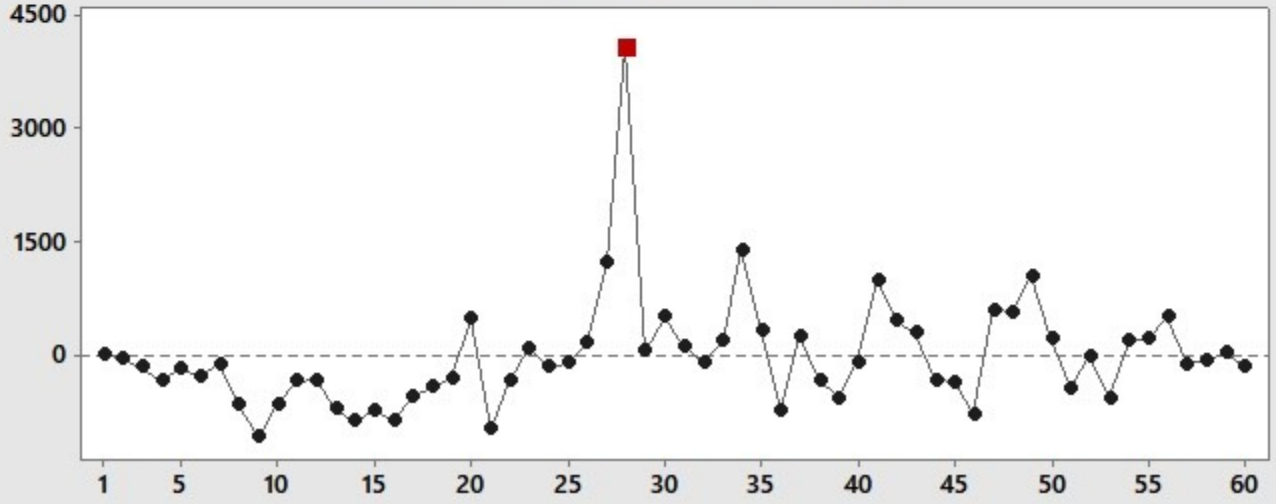
X	Predicted Y	95% PI
2000	-205.94	(-1810.9, 1399.0)
4000	-57.662	(-1649.0, 1533.6)
6000	90.621	(-1488.2, 1669.4)
8000	238.90	(-1328.5, 1806.4)
10000	387.19	(-1170.1, 1944.5)
12000	535.47	(-1012.8, 2083.8)
14000	683.75	(-856.80, 2224.3)
16000	832.03	(-701.99, 2366.1)
18000	980.31	(-548.44, 2509.1)
20000	1128.6	(-396.16, 2653.4)
22000	1276.9	(-245.15, 2798.9)
24000	1425.2	(-95.427, 2945.8)
26000	1573.4	(53.013, 3093.9)
28000	1721.7	(200.17, 3243.3)
30000	1870.0	(346.04, 3394.0)
32000	2018.3	(490.63, 3546.0)
34000	2166.6	(633.95, 3699.2)
36000	2314.9	(776.02, 3853.7)
38000	2463.1	(916.85, 4009.4)
40000	2611.4	(1056.5, 4166.4)
42000	2759.7	(1194.9, 4324.6)
44000	2908.0	(1332.1, 4483.9)
46000	3056.3	(1468.1, 4644.4)
48000	3204.5	(1603.1, 4806.0)
50000	3352.8	(1736.9, 4968.8)

Regression for America Deaths Daywise vs America Affected Daywise
Diagnostic Report

Residuals vs Fitted Values
Look for nonrandom patterns and large residuals.

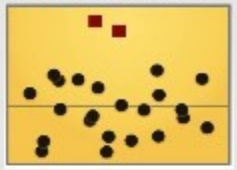


Residuals vs Observation Order
Look for nonrandom patterns and large residuals.



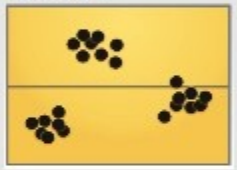
Look for these patterns:

Large Residuals

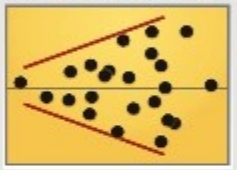


Strong Curvature

Clusters



Unequal Variation



Large Residuals

Cyclical

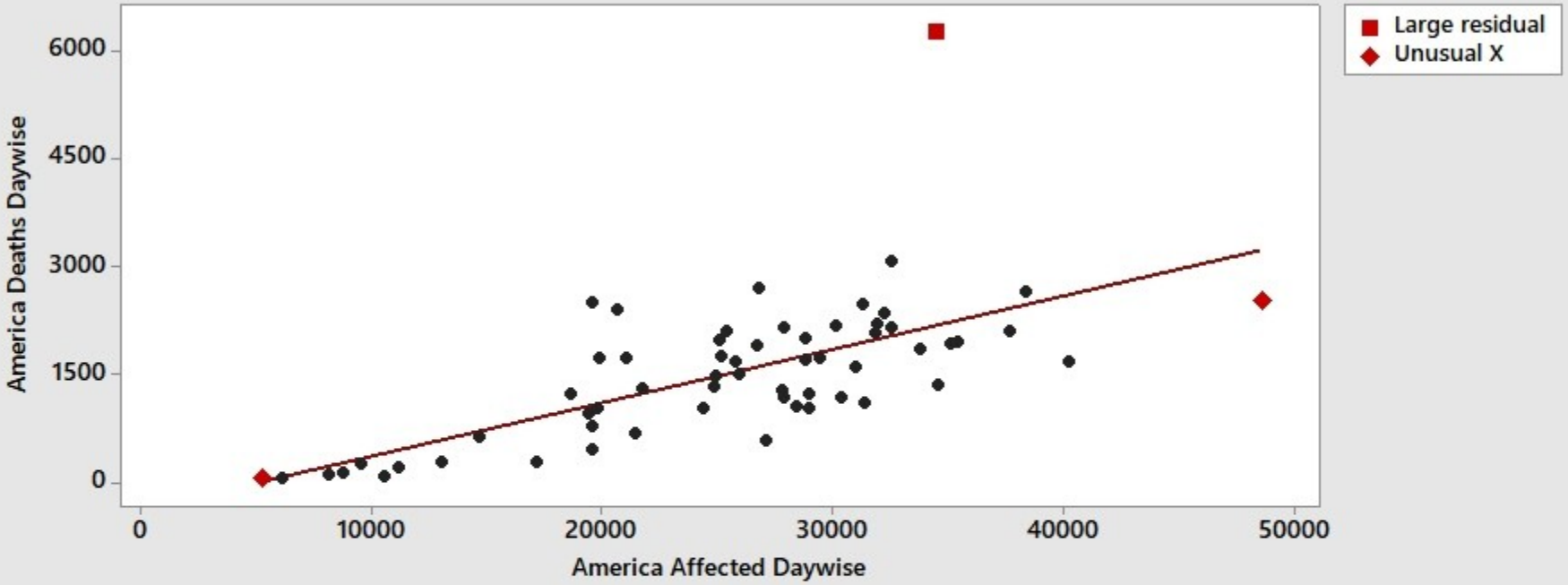
Trend

Shifts

Regression for America Deaths Daywise vs America Affected Daywise
Model Selection Report

Y: America Deaths Daywise
X: America Affected Daywise

Fitted Line Plot for Linear Model
Y = - 354.2 + 0.07414 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	42.73%	42.90%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.009*
P-value, quadratic term	—	0.285
Residual standard deviation	753.266	752.202

** Statistically significant ($p < 0.05$)*

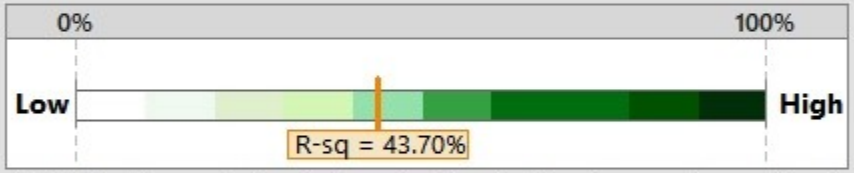
Regression for America Deaths Daywise vs America Affected Daywise
Summary Report

Y: America Deaths Daywise
X: America Affected Daywise

Is there a relationship between Y and X?

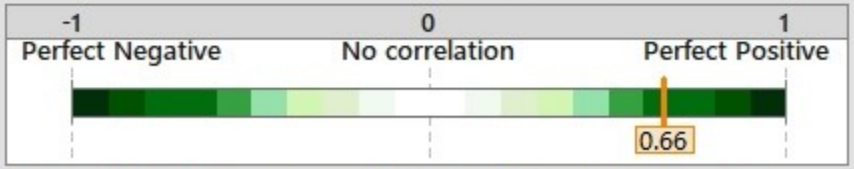
The relationship between America Deaths Daywise and America Affected Daywise is statistically significant ($p < 0.05$).

% of variation explained by the model



43.70% of the variation in America Deaths Daywise can be explained by the regression model.

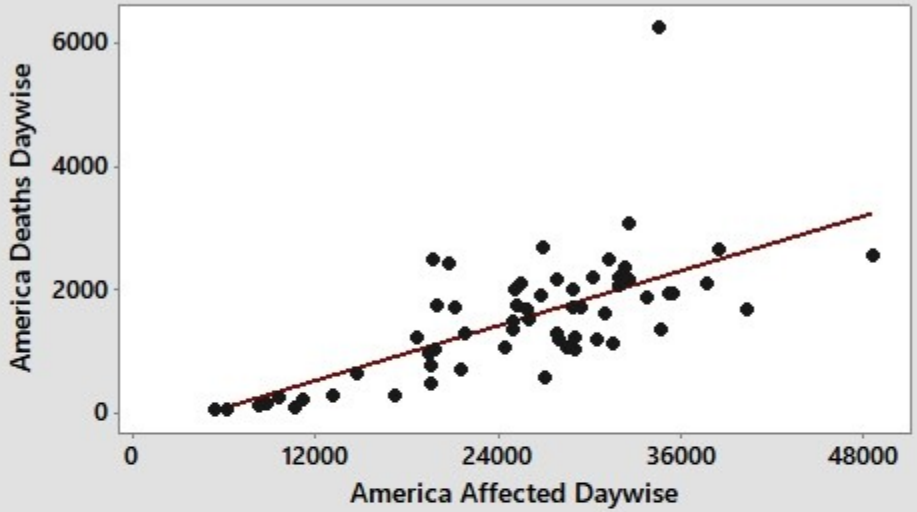
Correlation between Y and X



The positive correlation ($r = 0.66$) indicates that when America Affected Daywise increases, America Deaths Daywise also tends to increase.

Fitted Line Plot for Linear Model

Y = - 354.2 + 0.07414 X



Comments

The fitted equation for the linear model that describes the relationship between Y and X is:

Y = - 354.2 + 0.07414 X

If the model fits the data well, this equation can be used to predict America Deaths Daywise for a value of America Affected Daywise, or find the settings for America Affected Daywise that correspond to a desired value or range of values for America Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

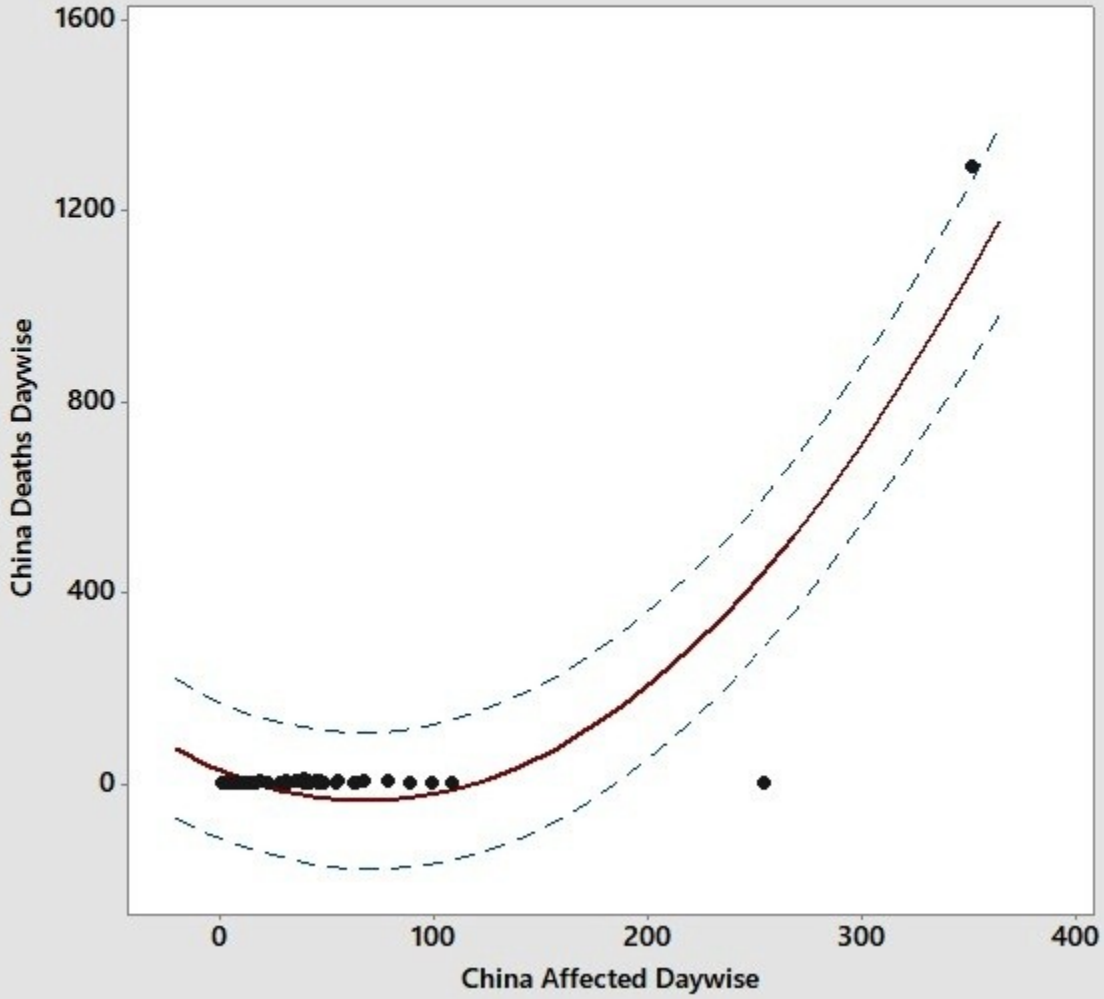
CHINA

Regression for China Deaths Daywise vs China Affected Daywise
Prediction Report

Y: China Deaths Daywise
X: China Affected Daywise

Prediction Plot

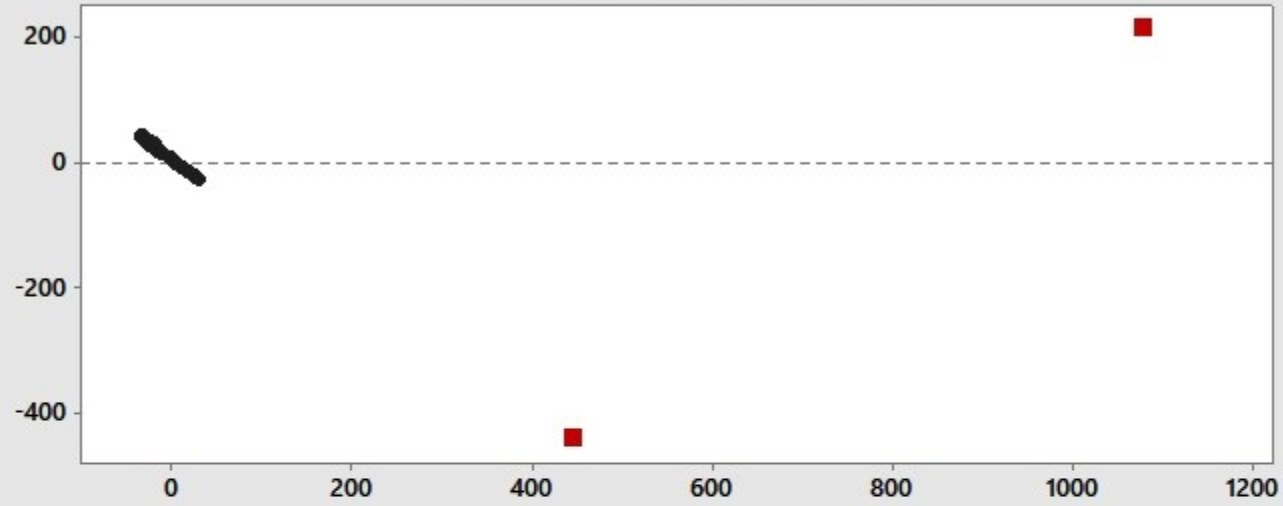
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
-20	74.633	(-71.113, 220.38)
-4	38.709	(-103.80, 181.22)
12	9.9211	(-130.93, 150.78)
28	-11.730	(-152.18, 128.72)
44	-26.244	(-167.22, 114.73)
60	-33.621	(-175.75, 108.51)
76	-33.862	(-177.51, 109.79)
92	-26.965	(-172.29, 118.36)
108	-12.932	(-159.92, 134.06)
124	8.2378	(-140.30, 156.77)
140	36.545	(-113.34, 186.43)
156	71.988	(-79.030, 223.01)
172	114.57	(-37.374, 266.51)
188	164.29	(11.577, 316.99)
204	221.14	(67.735, 374.55)
220	285.13	(130.97, 439.29)
236	356.26	(201.13, 511.39)
252	434.52	(278.01, 591.04)
268	519.92	(361.38, 678.47)
284	612.46	(451.01, 773.92)
300	712.14	(546.63, 877.64)
316	818.95	(648.01, 989.89)
332	932.90	(754.93, 1110.9)
348	1054.0	(867.19, 1240.8)
364	1182.2	(984.68, 1379.7)

Regression for China Deaths Daywise vs China Affected Daywise
Diagnostic Report

Residuals vs Fitted Values
Look for nonrandom patterns and large residuals.



Residuals vs Observation Order
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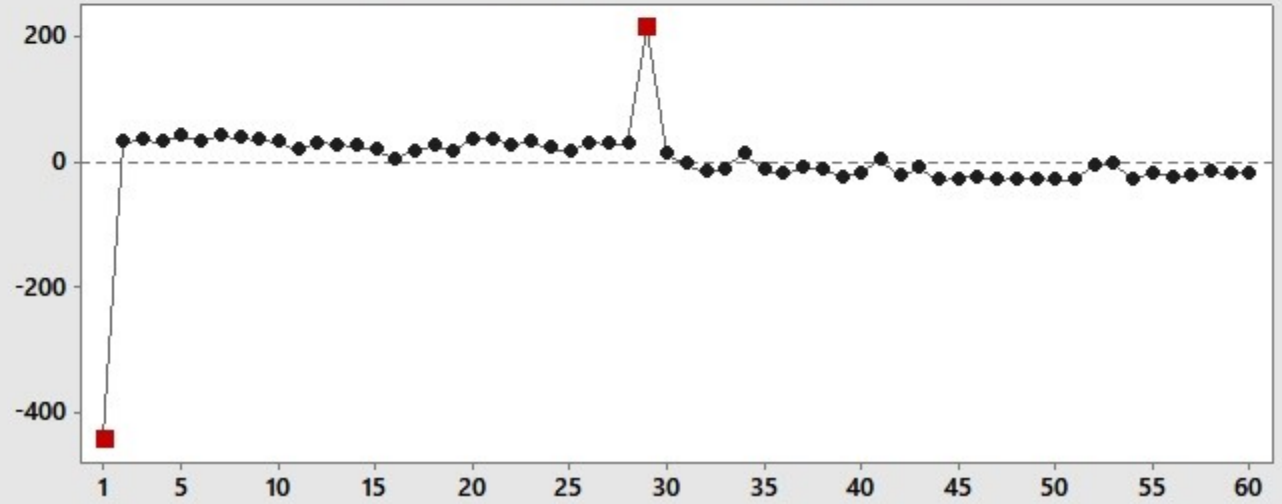
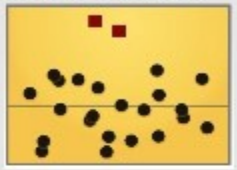


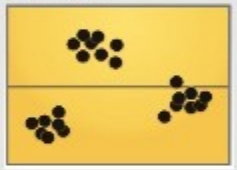
Look for these patterns:

Large Residuals

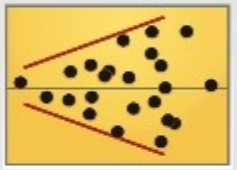


Strong Curvature

Clusters



Unequal Variation



Large Residuals

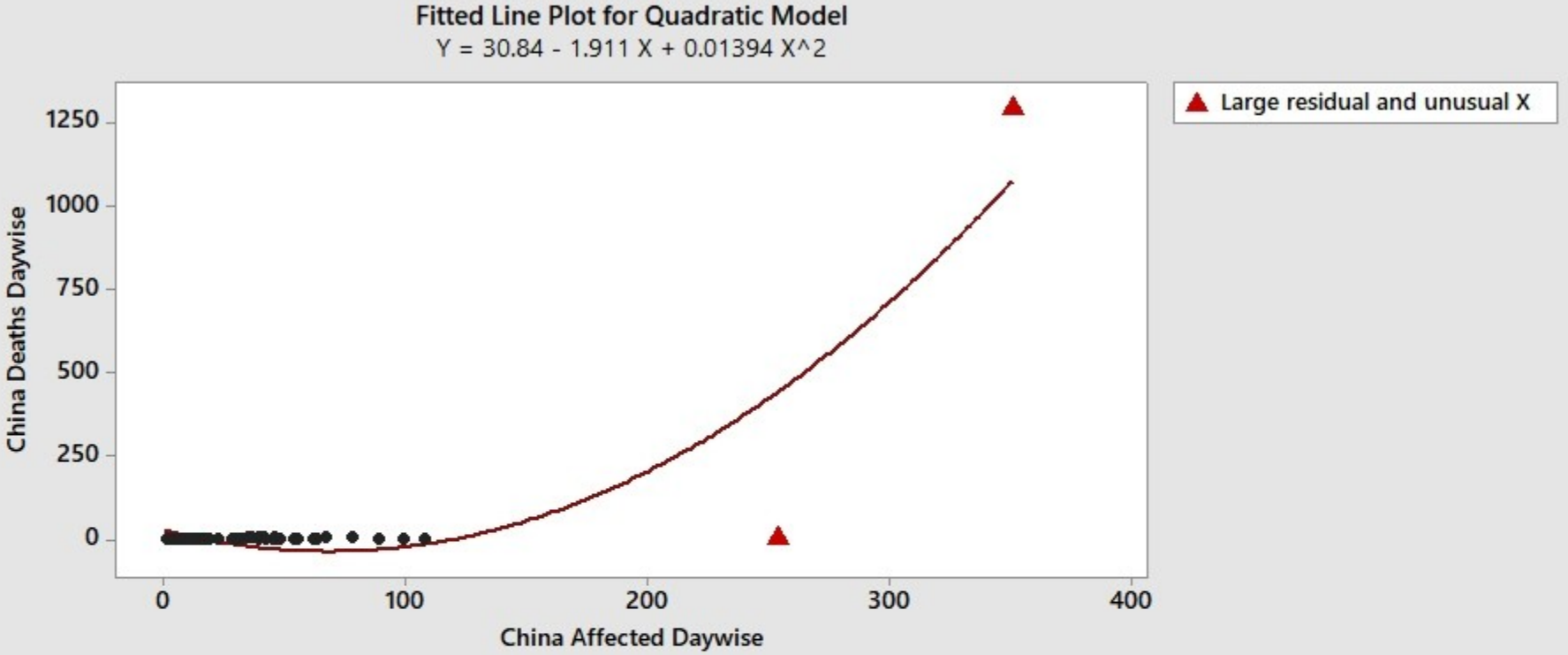
Cyclical

Trend

Shifts

Regression for China Deaths Daywise vs China Affected Daywise
Model Selection Report

Y: China Deaths Daywise
X: China Affected Daywise



Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	82.53%	52.35%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	<0.005*	—
Residual standard deviation	69.530	114.822

** Statistically significant ($p < 0.05$)*

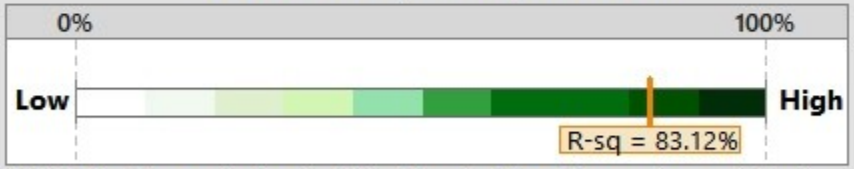
Regression for China Deaths Daywise vs China Affected Daywise
Summary Report

Y: China Deaths Daywise
X: China Affected Daywise

Is there a relationship between Y and X?

The relationship between China Deaths Daywise and China Affected Daywise is statistically significant (p < 0.05).

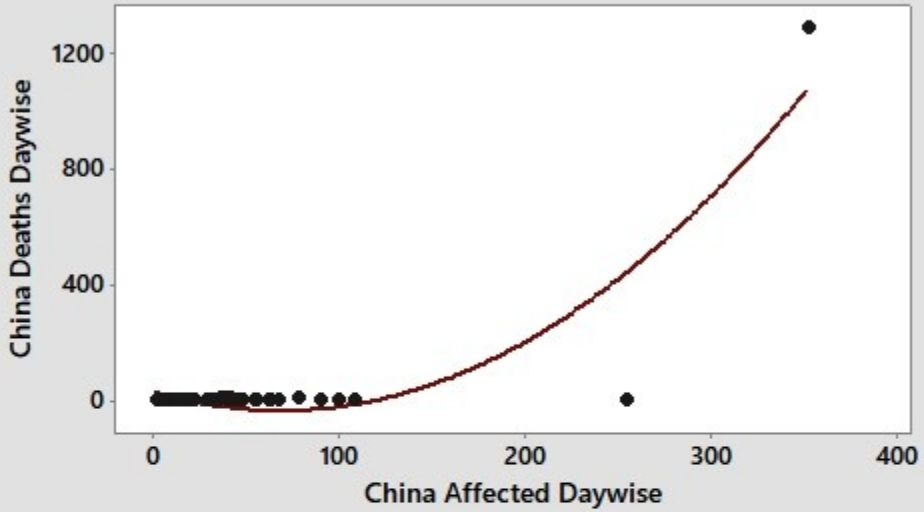
% of variation explained by the model



83.12% of the variation in China Deaths Daywise can be explained by the regression model.

Fitted Line Plot for Quadratic Model

Y = 30.84 - 1.911 X + 0.01394 X^2



Comments

The fitted equation for the quadratic model that describes the relationship between Y and X is:

Y = 30.84 - 1.911 X + 0.01394 X^2

If the model fits the data well, this equation can be used to predict China Deaths Daywise for a value of China Affected Daywise, or find the settings for China Affected Daywise that correspond to a desired value or range of values for China Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

ENGLAND

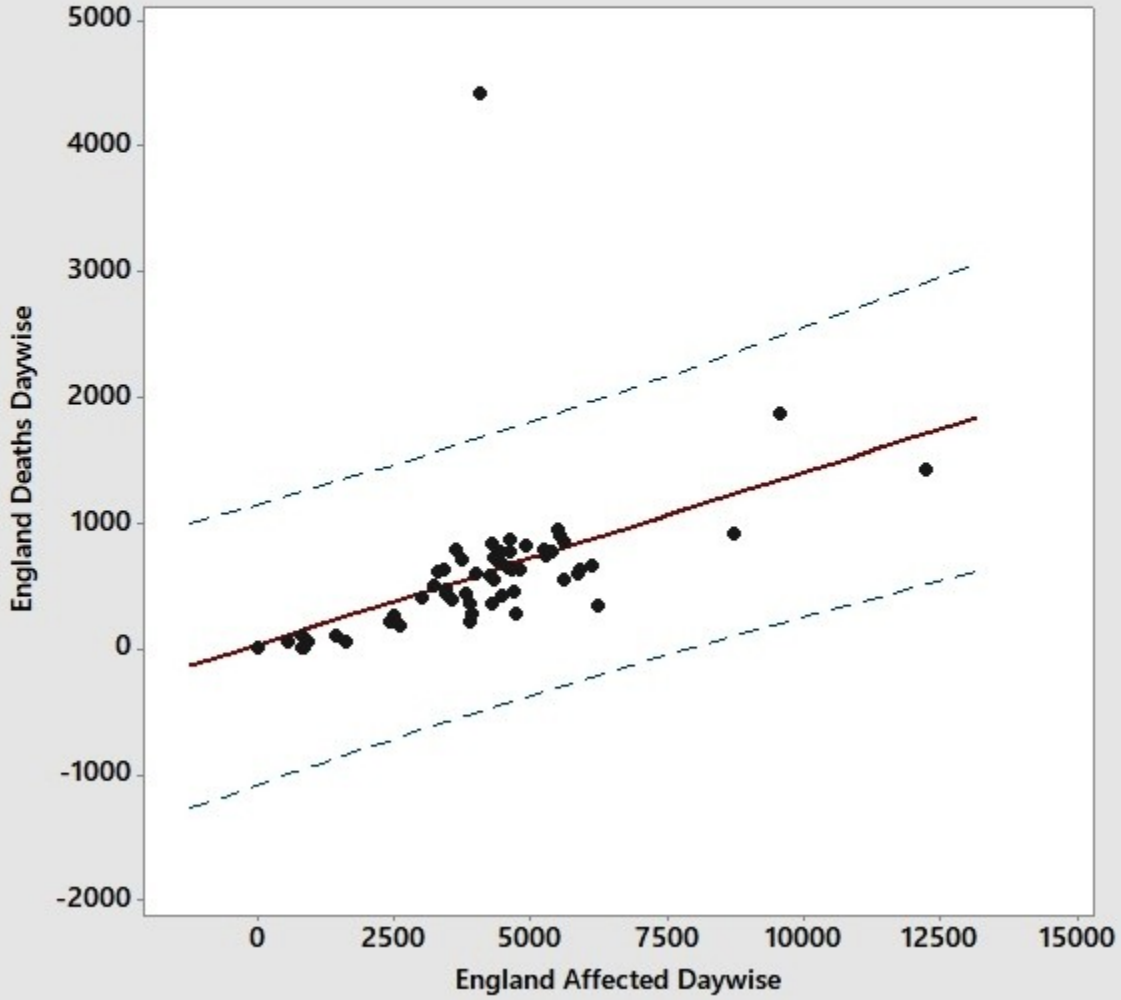
Regression for England Deaths Daywise vs England Affected Daywise

Prediction Report

Y: England Deaths Daywise
X: England Affected Daywise

Prediction Plot

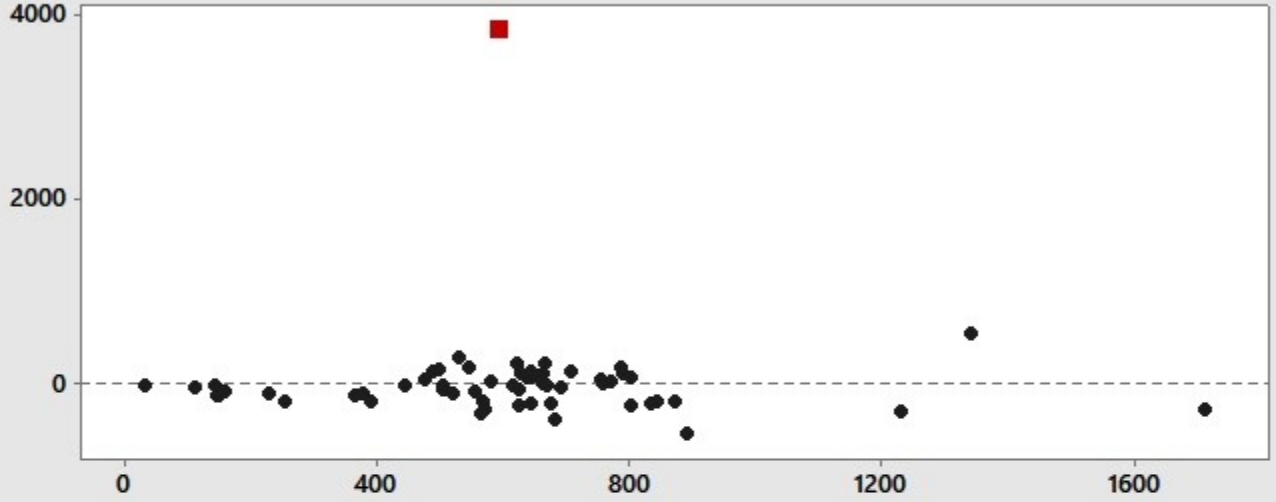
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



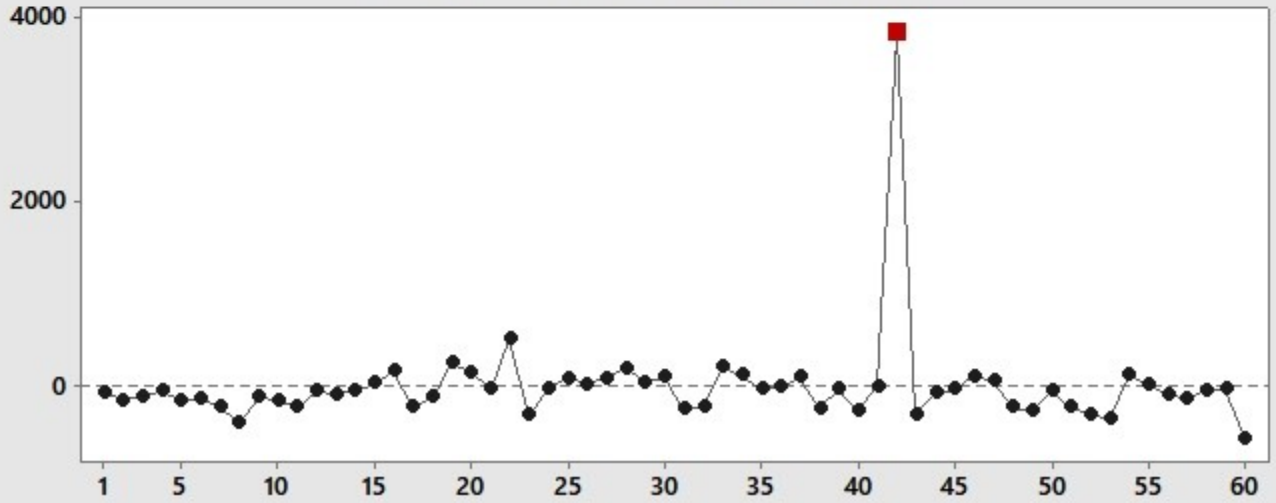
X	Predicted Y	95% PI
-1200	-133.57	(-1267.2, 1000.1)
-600	-51.138	(-1174.6, 1072.3)
0	31.291	(-1083.1, 1145.7)
600	113.72	(-992.85, 1220.3)
1200	196.15	(-903.84, 1296.1)
1800	278.58	(-816.08, 1373.2)
2400	361.01	(-729.60, 1451.6)
3000	443.44	(-644.40, 1531.3)
3600	525.87	(-560.50, 1612.2)
4200	608.30	(-477.90, 1694.5)
4800	690.73	(-396.61, 1778.1)
5400	773.16	(-316.61, 1862.9)
6000	855.59	(-237.91, 1949.1)
6600	938.02	(-160.49, 2036.5)
7200	1020.4	(-84.321, 2125.2)
7800	1102.9	(-9.3946, 2215.2)
8400	1185.3	(64.317, 2306.3)
9000	1267.7	(136.84, 2398.6)
9600	1350.2	(208.21, 2492.1)
10200	1432.6	(278.46, 2586.7)
10800	1515.0	(347.62, 2682.4)
11400	1597.5	(415.74, 2779.2)
12000	1679.9	(482.83, 2876.9)
12600	1762.3	(548.96, 2975.7)
13200	1844.7	(614.15, 3075.3)

Regression for England Deaths Daywise vs England Affected Daywise
Diagnostic Report

Residuals vs Fitted Values
Look for nonrandom patterns and large residuals.

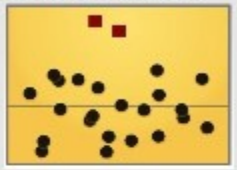


Residuals vs Observation Order
Look for nonrandom patterns and large residuals.



Look for these patterns:

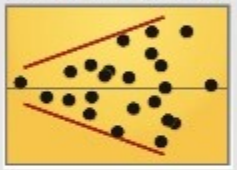
Large Residuals



Strong Curvature

Clusters

Unequal Variation



Large Residuals

Cyclical

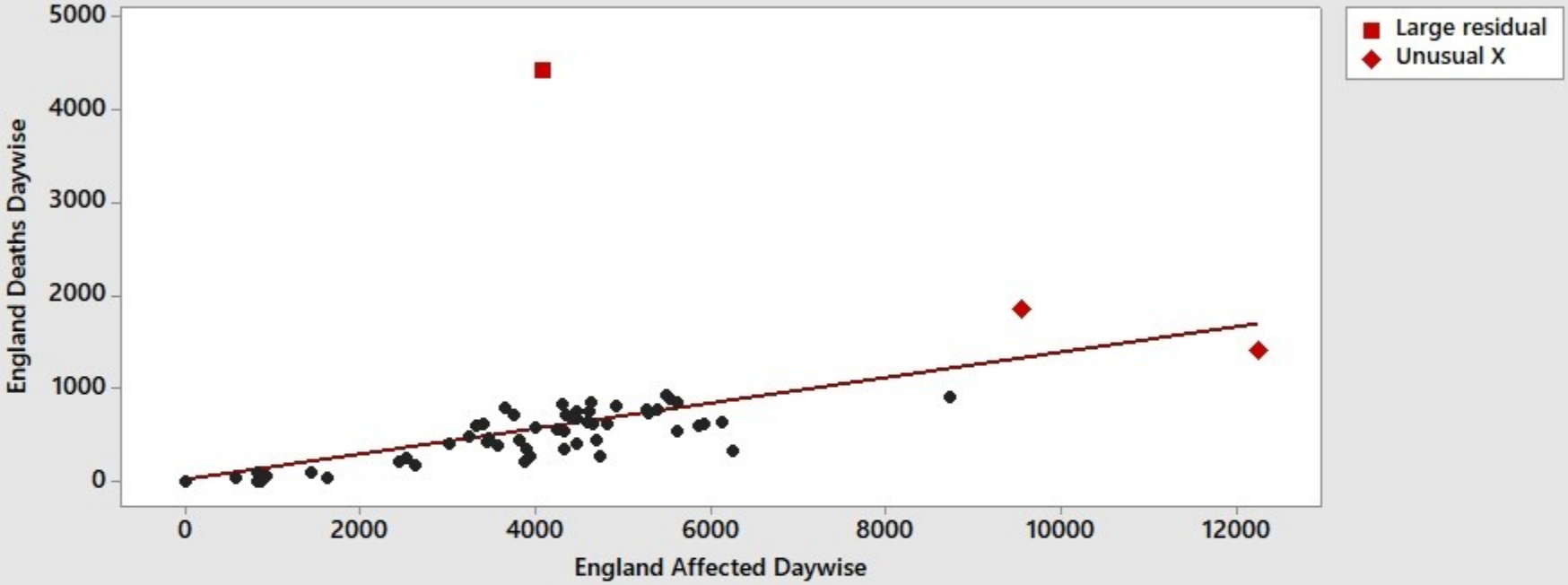
Trend

Shifts

Regression for England Deaths Daywise vs England Affected Daywise
Model Selection Report

Y: England Deaths Daywise
X: England Affected Daywise

Fitted Line Plot for Linear Model
Y = 31.3 + 0.1374 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	23.59%	22.85%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	0.018*
P-value, quadratic term	—	0.509
Residual standard deviation	538.124	540.737

** Statistically significant ($p < 0.05$)*

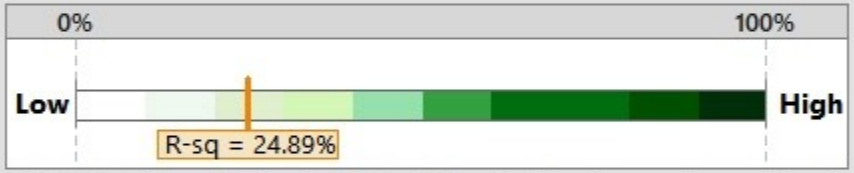
Regression for England Deaths Daywise vs England Affected Daywise
Summary Report

Y: England Deaths Daywise
X: England Affected Daywise

Is there a relationship between Y and X?

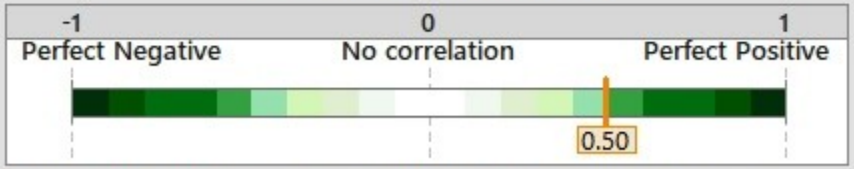
The relationship between England Deaths Daywise and England Affected Daywise is statistically significant ($p < 0.05$).

% of variation explained by the model



24.89% of the variation in England Deaths Daywise can be explained by the regression model.

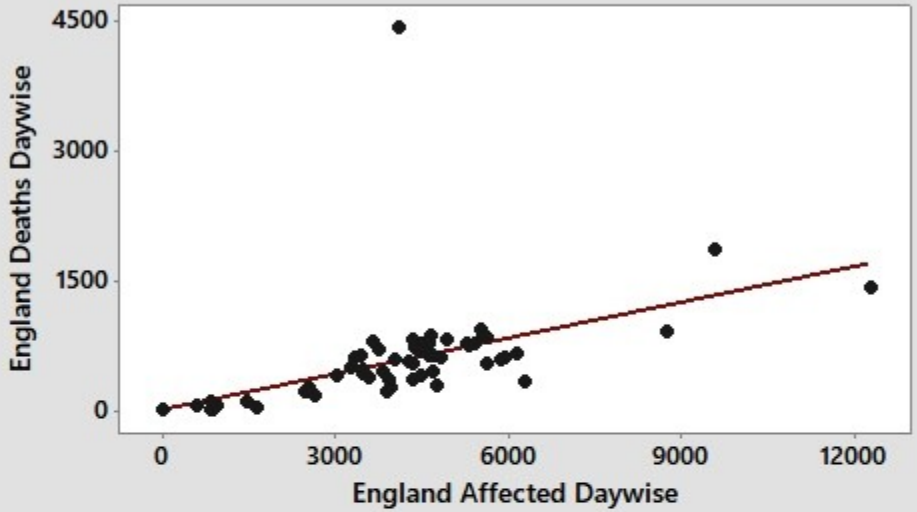
Correlation between Y and X



The positive correlation ($r = 0.50$) indicates that when England Affected Daywise increases, England Deaths Daywise also tends to increase.

Fitted Line Plot for Linear Model

Y = 31.3 + 0.1374 X



Comments

The fitted equation for the linear model that describes the relationship between Y and X is:

Y = 31.3 + 0.1374 X

If the model fits the data well, this equation can be used to predict England Deaths Daywise for a value of England Affected Daywise, or find the settings for England Affected Daywise that correspond to a desired value or range of values for England Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

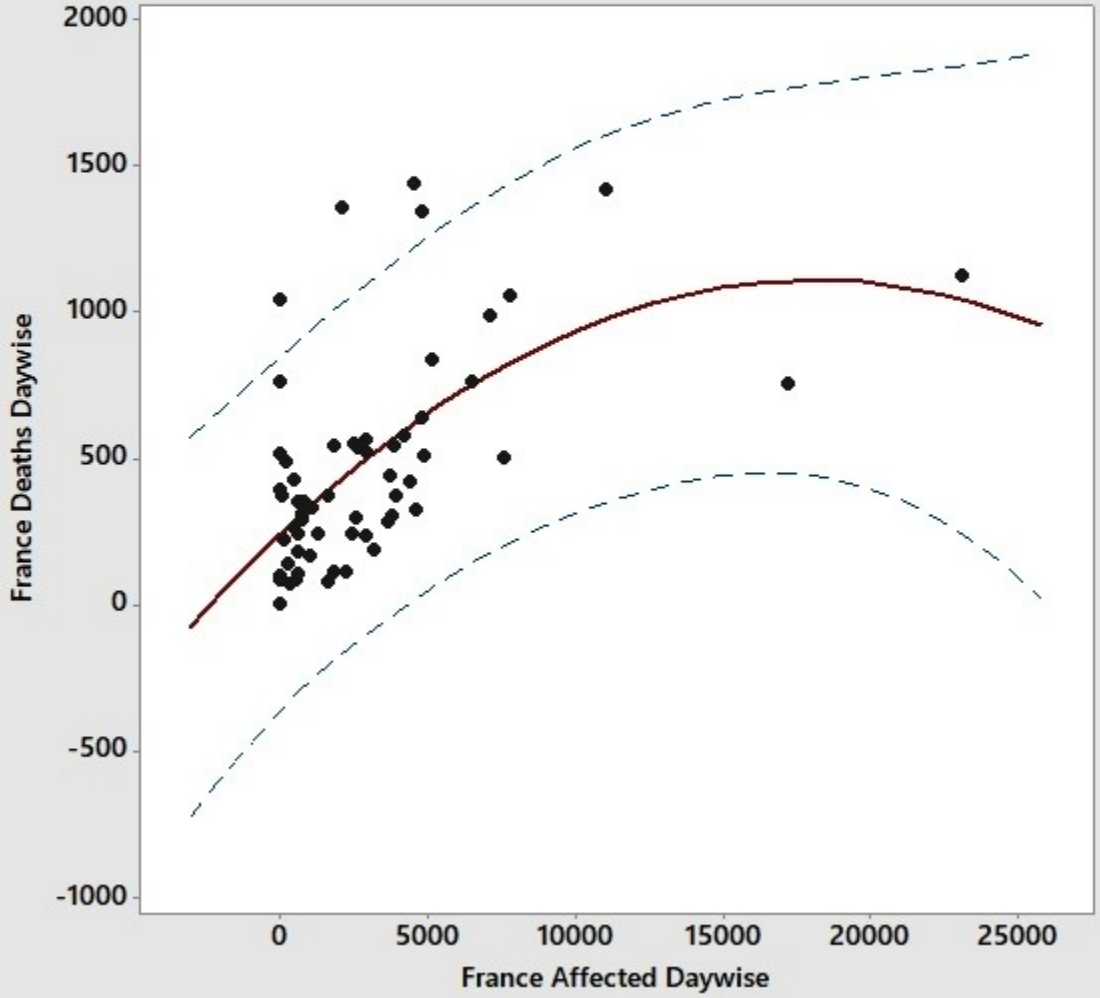
FRANCE

Regression for France Deaths Daywise vs France Affected Daywise
Prediction Report

Y: France Deaths Daywise
X: France Affected Daywise

Prediction Plot

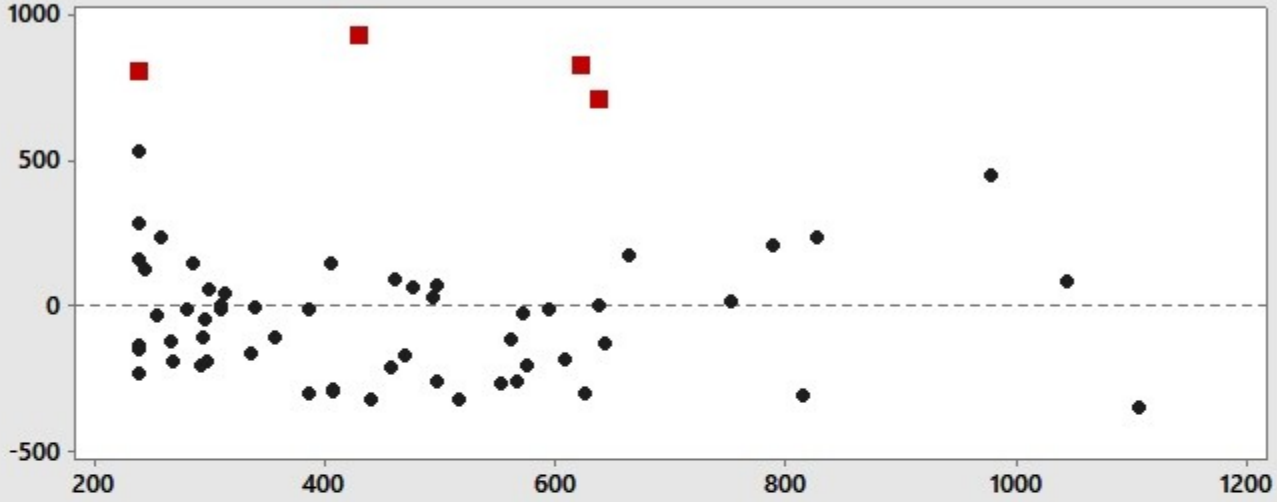
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



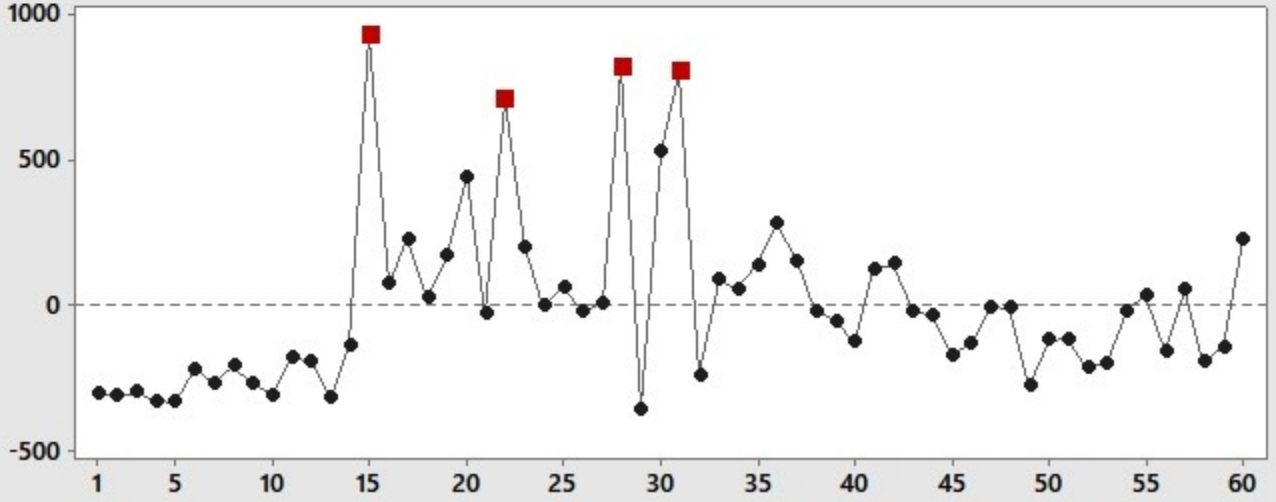
X	Predicted Y	95% PI
-3000	-75.242	(-724.06, 573.57)
-1800	55.577	(-569.45, 680.60)
-600	178.75	(-430.82, 788.31)
600	294.26	(-306.76, 895.28)
1800	402.13	(-195.70, 999.96)
3000	502.34	(-96.152, 1100.8)
4200	594.90	(-6.7561, 1196.6)
5400	679.82	(73.611, 1286.0)
6600	757.08	(145.82, 1368.3)
7800	826.68	(210.47, 1442.9)
9000	888.64	(267.91, 1509.4)
10200	942.95	(318.25, 1567.6)
11400	989.60	(361.35, 1617.9)
12600	1028.6	(396.84, 1660.4)
13800	1060.0	(424.15, 1695.8)
15000	1083.7	(442.48, 1724.8)
16200	1099.7	(450.82, 1748.6)
17400	1108.1	(448.03, 1768.2)
18600	1108.9	(432.86, 1784.8)
19800	1101.9	(404.05, 1799.9)
21000	1087.4	(360.40, 1814.4)
22200	1065.2	(300.90, 1829.5)
23400	1035.3	(224.77, 1845.9)
24600	997.82	(131.49, 1864.1)
25800	952.66	(20.788, 1884.5)

Regression for France Deaths Daywise vs France Affected Daywise
Diagnostic Report

Residuals vs Fitted Values
Look for nonrandom patterns and large residuals.

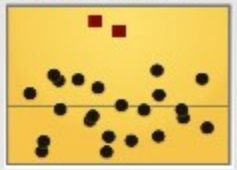


Residuals vs Observation Order
Look for nonrandom patterns and large residuals.



Look for these patterns:

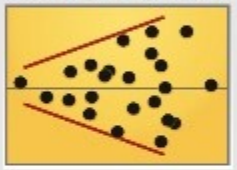
Large Residuals



Strong Curvature

Clusters

Unequal Variation



Large Residuals

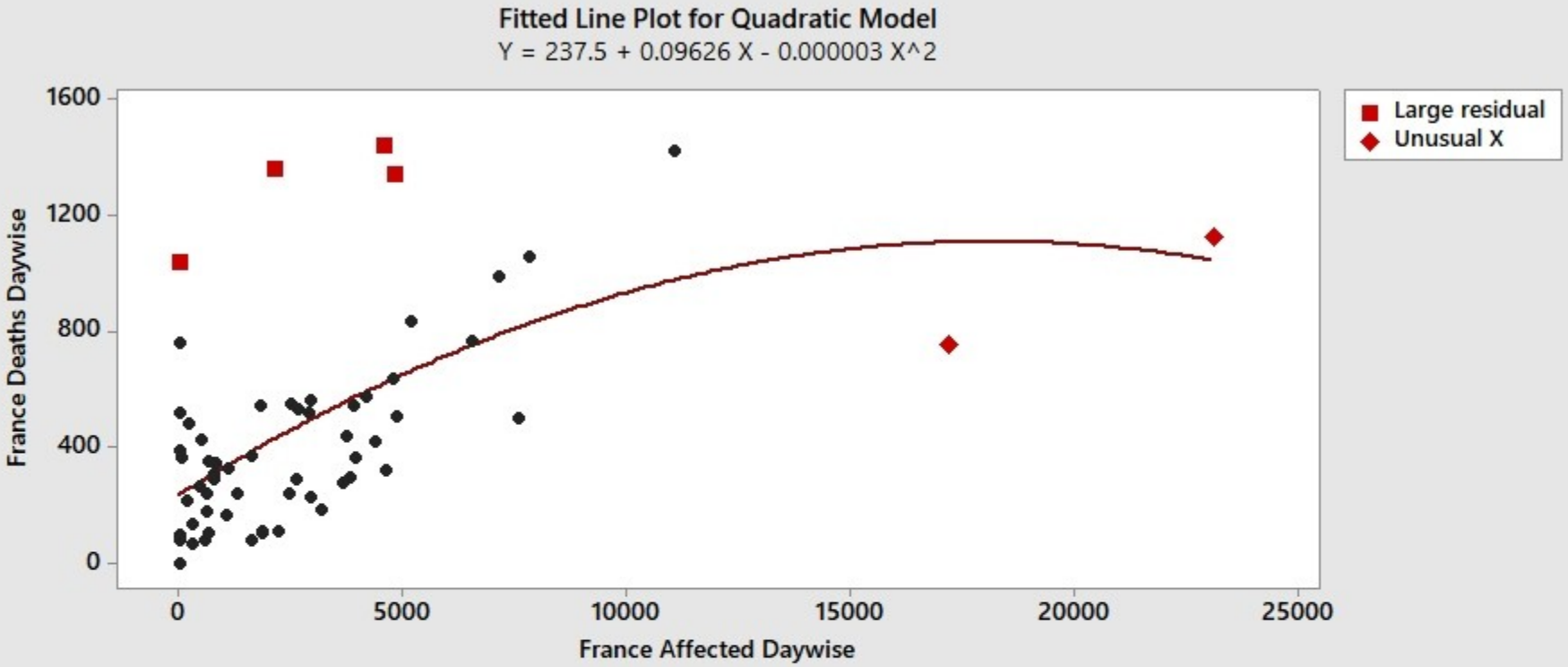
Cyclical

Trend

Shifts

Regression for France Deaths Daywise vs France Affected Daywise
Model Selection Report

Y: France Deaths Daywise
X: France Affected Daywise



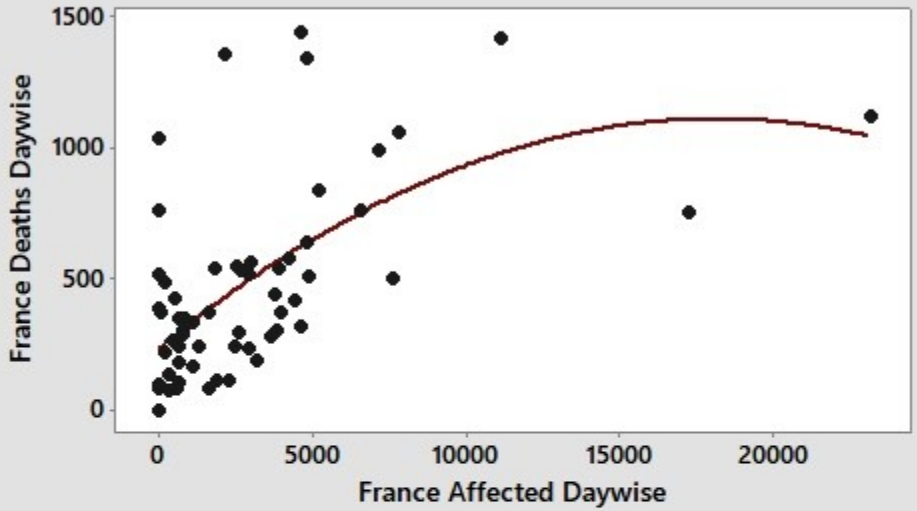
Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	32.41%	28.01%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	0.033*	—
Residual standard deviation	295.850	305.342

** Statistically significant ($p < 0.05$)*

Regression for France Deaths Daywise vs France Affected Daywise
Summary Report

Y: France Deaths Daywise
X: France Affected Daywise

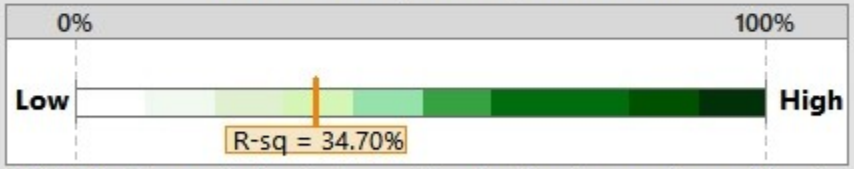
Fitted Line Plot for Quadratic Model
Y = 237.5 + 0.09626 X - 0.000003 X^2



Is there a relationship between Y and X?

The relationship between France Deaths Daywise and France Affected Daywise is statistically significant ($p < 0.05$).

% of variation explained by the model



34.70% of the variation in France Deaths Daywise can be explained by the regression model.

Comments

The fitted equation for the quadratic model that describes the relationship between Y and X is:

Y = 237.5 + 0.09626 X - 0.000003 X^2

If the model fits the data well, this equation can be used to predict France Deaths Daywise for a value of France Affected Daywise, or find the settings for France Affected Daywise that correspond to a desired value or range of values for France Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

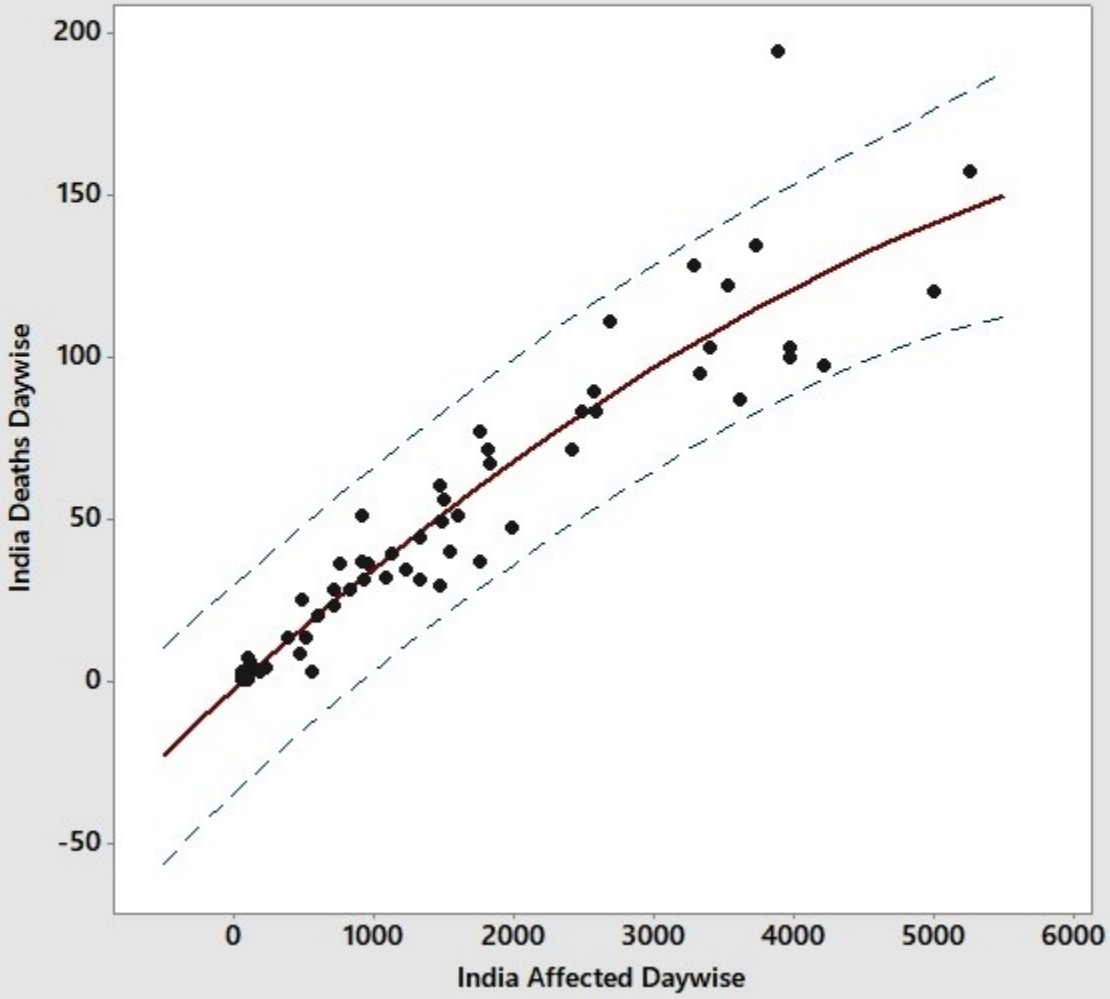
INDIA

Regression for India Deaths Daywise vs India Affected Daywise
Prediction Report

Y: India Deaths Daywise
X: India Affected Daywise

Prediction Plot

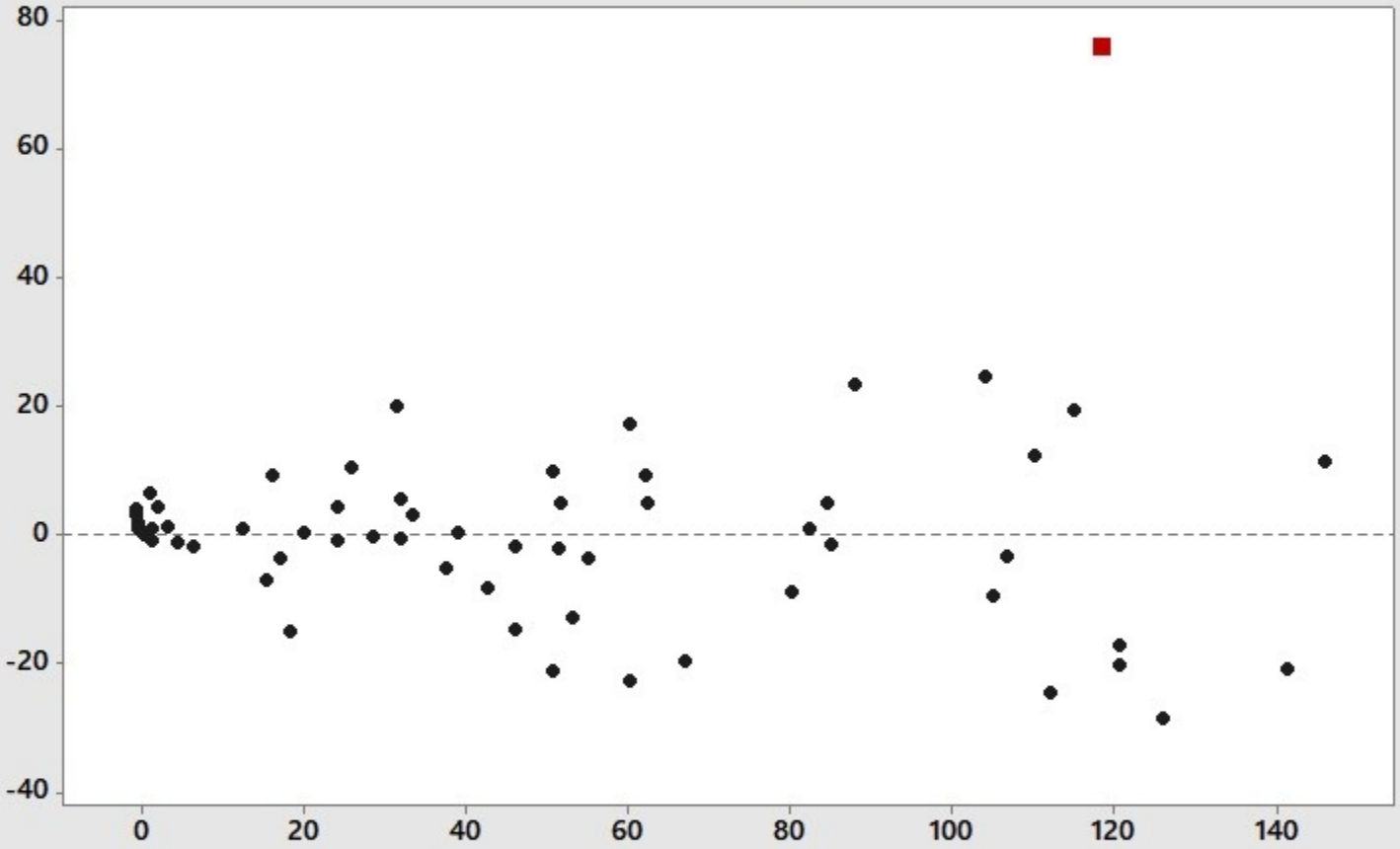
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
-500	-22.857	(-56.369, 10.654)
-250	-12.596	(-45.281, 20.089)
0	-2.6002	(-34.714, 29.513)
250	7.1298	(-24.621, 38.881)
500	16.594	(-14.958, 48.146)
750	25.792	(-5.6822, 57.267)
1000	34.725	(3.2458, 66.204)
1250	43.392	(11.859, 74.925)
1500	51.793	(20.185, 83.401)
1750	59.928	(28.244, 91.613)
2000	67.798	(36.050, 99.546)
2250	75.401	(43.610, 107.19)
2500	82.739	(50.926, 114.55)
2750	89.811	(57.993, 121.63)
3000	96.618	(64.799, 128.44)
3250	103.16	(71.326, 134.99)
3500	109.43	(77.551, 141.31)
3750	115.44	(83.444, 147.44)
4000	121.19	(88.968, 153.40)
4250	126.66	(94.084, 159.24)
4500	131.87	(98.748, 165.00)
4750	136.82	(102.92, 170.72)
5000	141.50	(106.55, 176.45)
5250	145.91	(109.61, 182.22)
5500	150.06	(112.07, 188.05)

Regression for India Deaths Daywise vs India Affected Daywise
Diagnostic Report

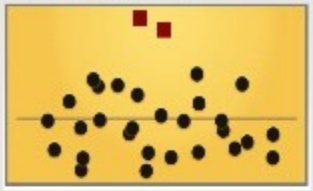
Residuals vs Fitted Values



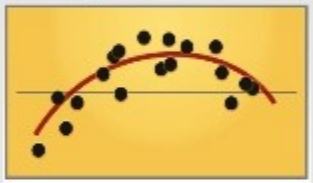
Look for patterns, such as strong curvature or clusters, that may indicate problems with the regression model. Ideally, the points should fall randomly on both sides of zero. Identify any large residuals that could have a strong influence on the fitted line.

Look for these patterns:

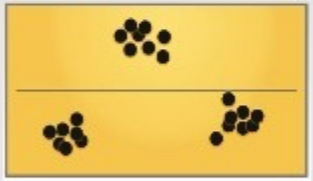
Large Residuals



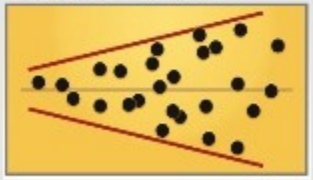
Strong Curvature



Clusters



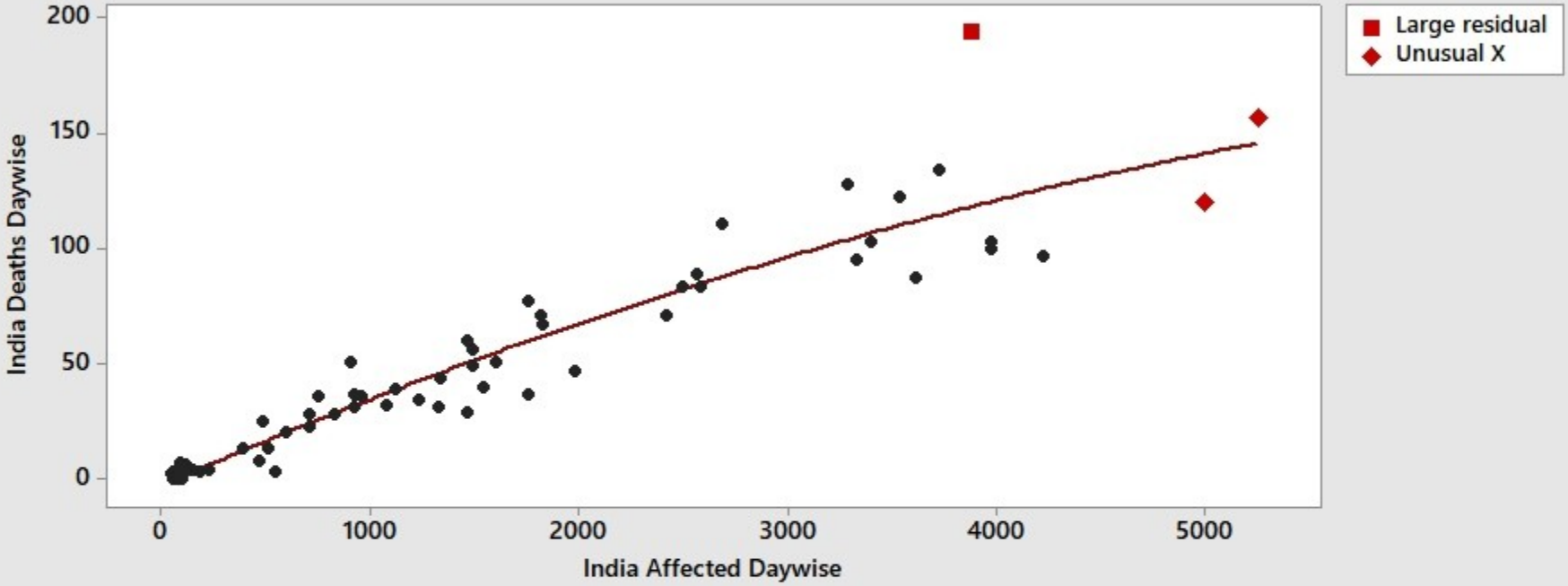
Unequal Variation



Regression for India Deaths Daywise vs India Affected Daywise
Model Selection Report

Y: India Deaths Daywise
X: India Affected Daywise

Fitted Line Plot for Quadratic Model
Y = - 2.600 + 0.03945 X - 0.000002 X^2



Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	88.19%	87.54%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	0.045*	—
Residual standard deviation	15.541	15.965

** Statistically significant ($p < 0.05$)*

Regression for India Deaths Daywise vs India Affected Daywise
Summary Report

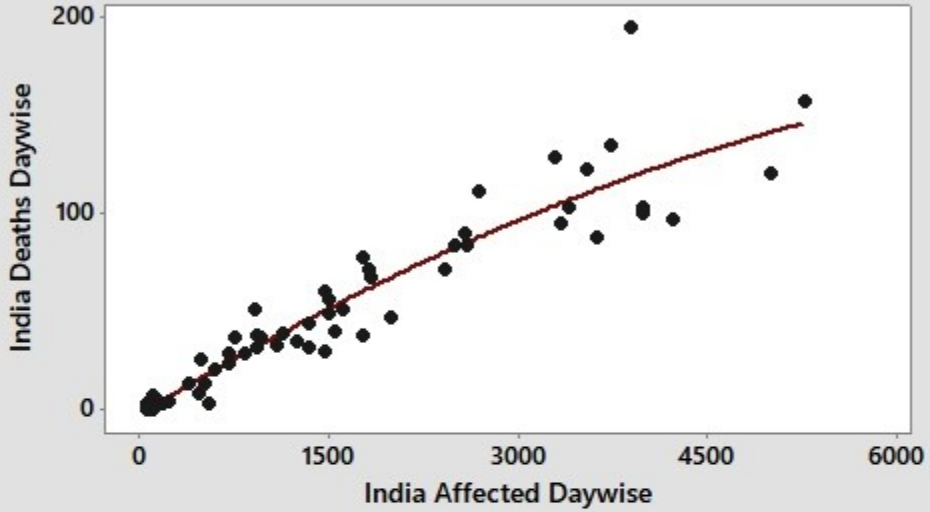
Y: India Deaths Daywise
X: India Affected Daywise

Is there a relationship between Y and X?

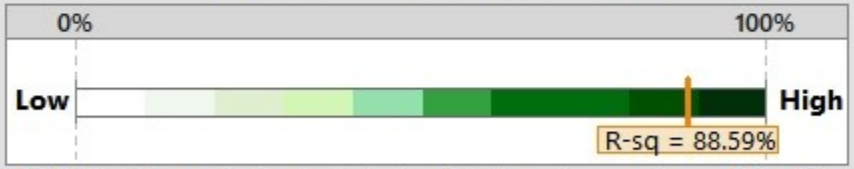
The relationship between India Deaths Daywise and India Affected Daywise is statistically significant ($p < 0.05$).

Fitted Line Plot for Quadratic Model

Y = - 2.600 + 0.03945 X - 0.000002 X^2



% of variation explained by the model



88.59% of the variation in India Deaths Daywise can be explained by the regression model.

Comments

The fitted equation for the quadratic model that describes the relationship between Y and X is:

Y = - 2.600 + 0.03945 X - 0.000002 X^2

If the model fits the data well, this equation can be used to predict India Deaths Daywise for a value of India Affected Daywise, or find the settings for India Affected Daywise that correspond to a desired value or range of values for India Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

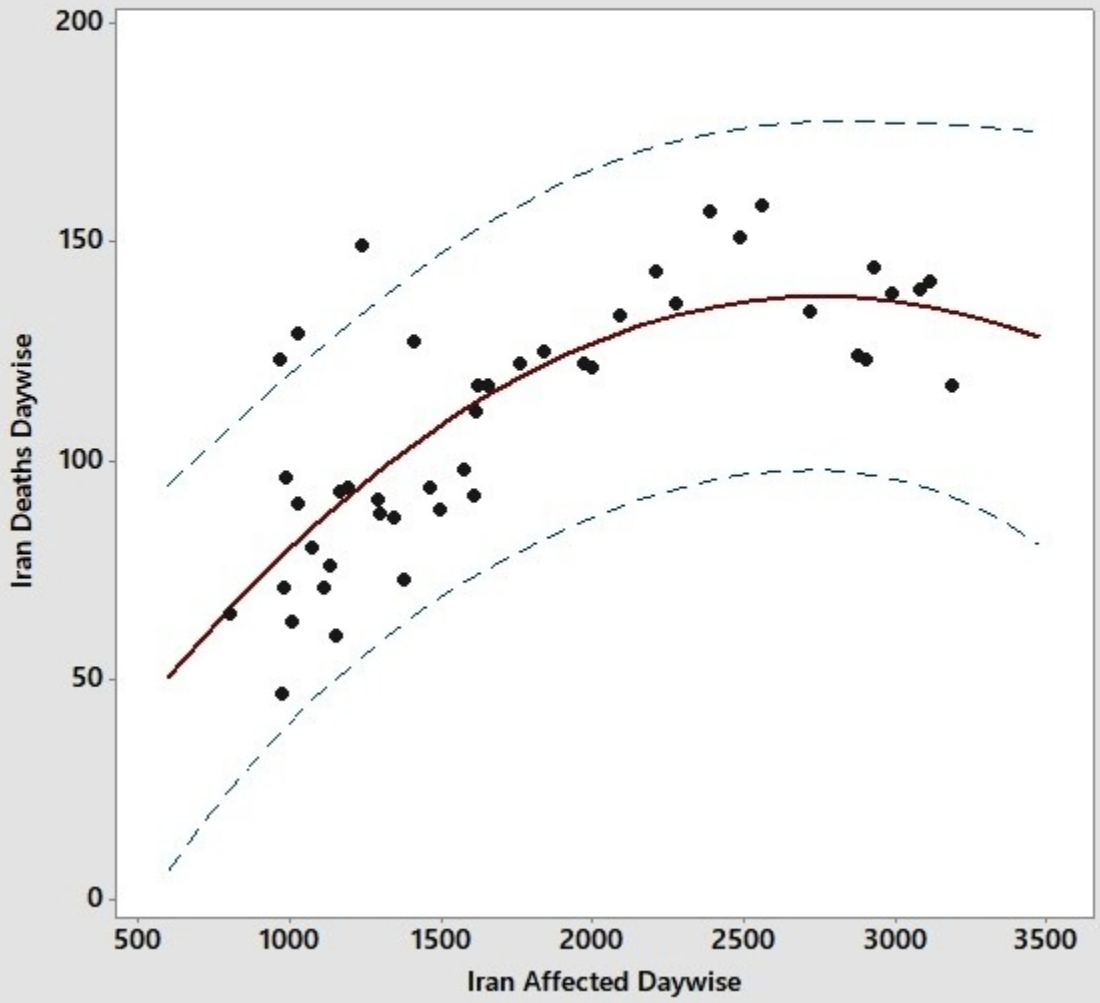
IRAN

Regression for Iran Deaths Daywise vs Iran Affected Daywise
Prediction Report

Y: Iran Deaths Daywise
X: Iran Affected Daywise

Prediction Plot

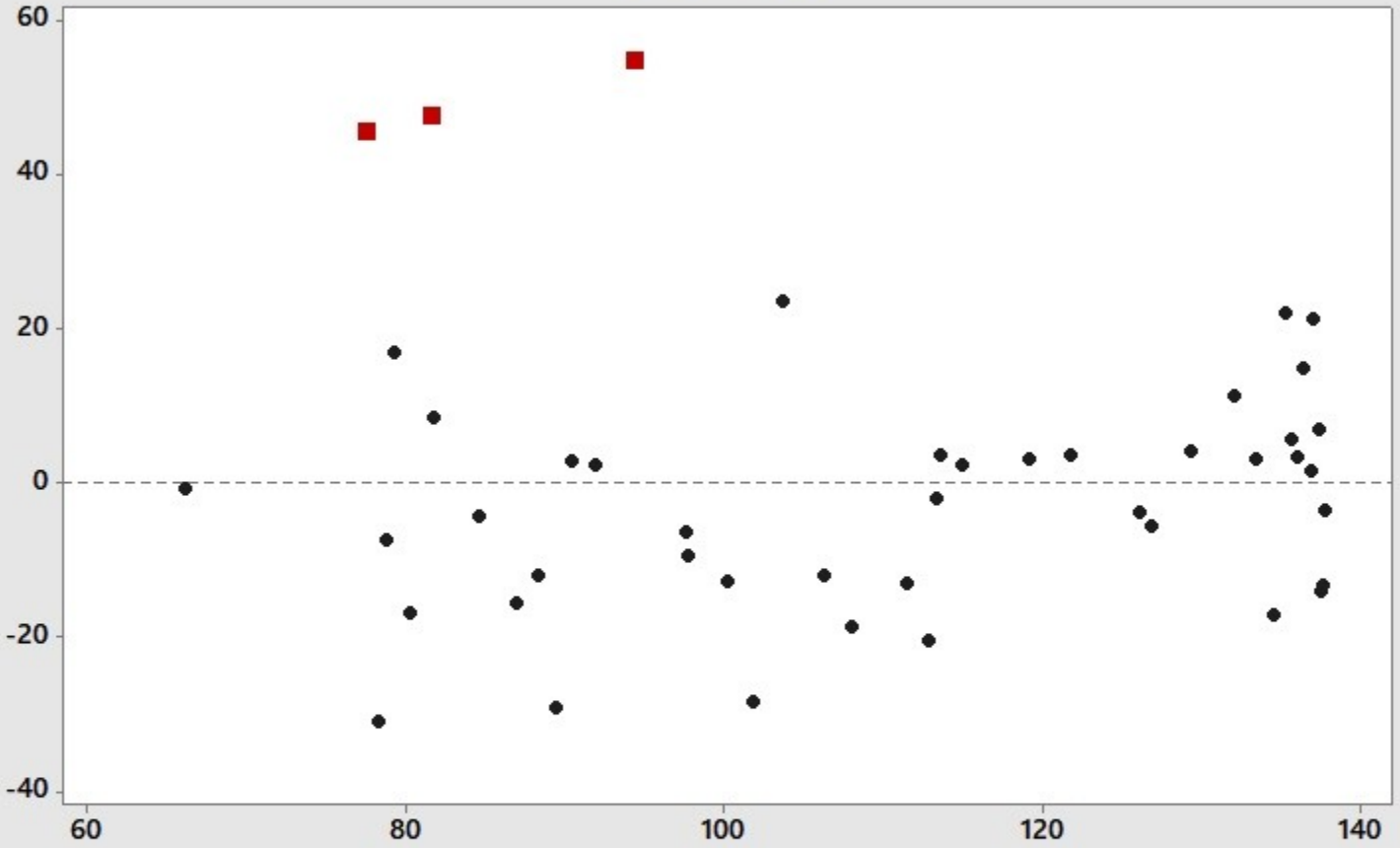
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
600	50.542	(6.3626, 94.721)
720	59.948	(17.661, 102.24)
840	68.818	(27.909, 109.73)
960	77.151	(37.174, 117.13)
1080	84.947	(45.533, 124.36)
1200	92.207	(53.070, 131.34)
1320	98.930	(59.864, 137.99)
1440	105.12	(65.988, 144.24)
1560	110.77	(71.504, 150.03)
1680	115.88	(76.462, 155.29)
1800	120.45	(80.898, 160.01)
1920	124.49	(84.837, 164.15)
2040	128.00	(88.292, 167.70)
2160	130.96	(91.263, 170.66)
2280	133.39	(93.738, 173.05)
2400	135.28	(95.695, 174.88)
2520	136.64	(97.097, 176.19)
2640	137.46	(97.897, 177.02)
2760	137.74	(98.034, 177.45)
2880	137.49	(97.441, 177.54)
3000	136.70	(96.039, 177.36)
3120	135.37	(93.750, 176.99)
3240	133.51	(90.496, 176.52)
3360	131.11	(86.213, 176.00)
3480	128.17	(80.848, 175.49)

Regression for Iran Deaths Daywise vs Iran Affected Daywise
Diagnostic Report

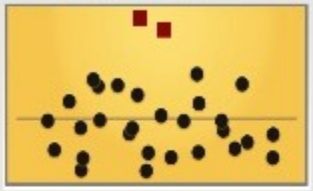
Residuals vs Fitted Values



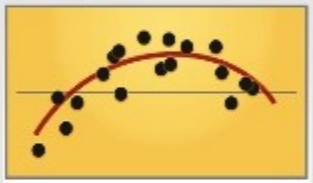
Look for patterns, such as strong curvature or clusters, that may indicate problems with the regression model. Ideally, the points should fall randomly on both sides of zero. Identify any large residuals that could have a strong influence on the fitted line.

Look for these patterns:

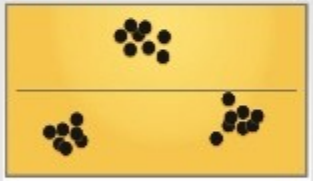
Large Residuals



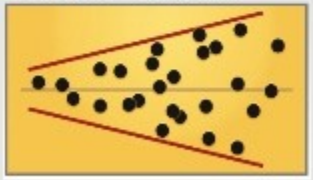
Strong Curvature



Clusters



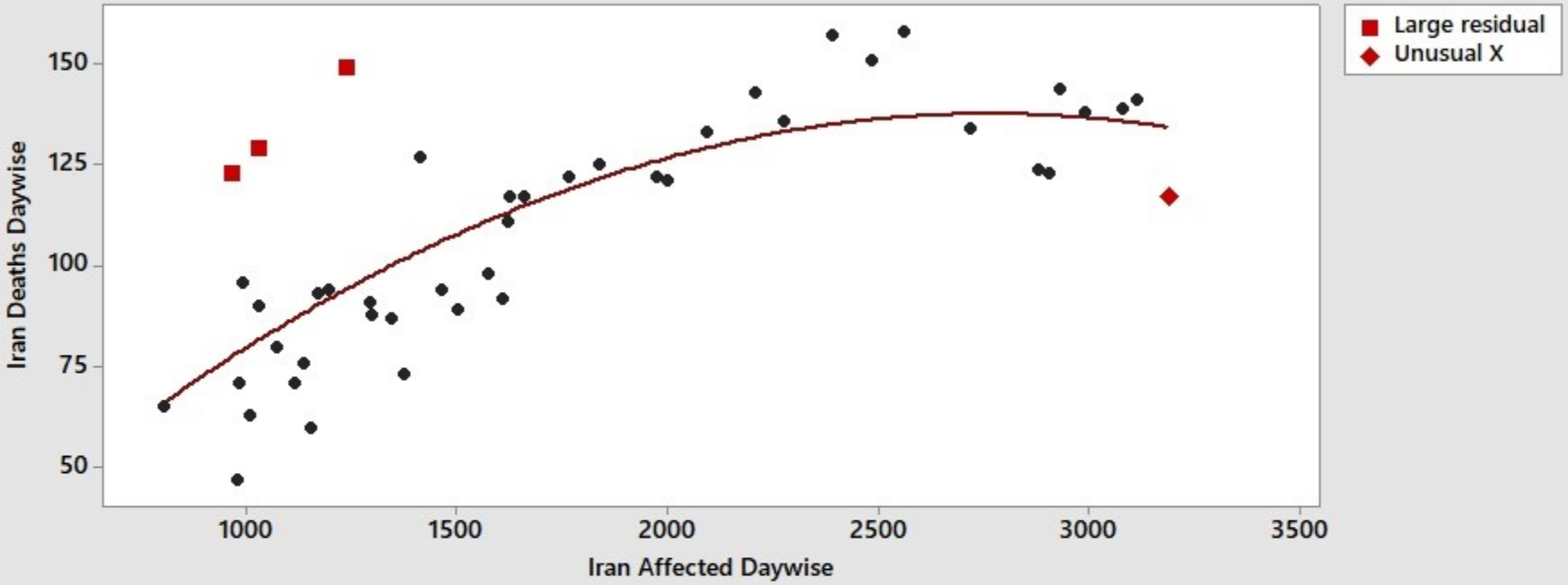
Unequal Variation



Regression for Iran Deaths Daywise vs Iran Affected Daywise
Model Selection Report

Y: Iran Deaths Daywise
X: Iran Affected Daywise

Fitted Line Plot for Quadratic Model
Y = - 4.54 + 0.1030 X - 0.000019 X^2



Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	56.97%	50.60%
P-value, model	<0.005*	<0.005*
P-value, linear term	0.001*	<0.005*
P-value, quadratic term	0.010*	—
Residual standard deviation	19.052	20.414

** Statistically significant ($p < 0.05$)*

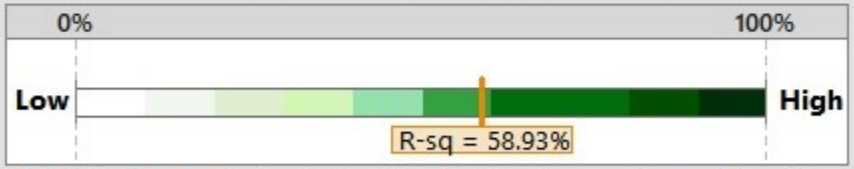
Regression for Iran Deaths Daywise vs Iran Affected Daywise
Summary Report

Y: Iran Deaths Daywise
X: Iran Affected Daywise

Is there a relationship between Y and X?

The relationship between Iran Deaths Daywise and Iran Affected Daywise is statistically significant ($p < 0.05$).

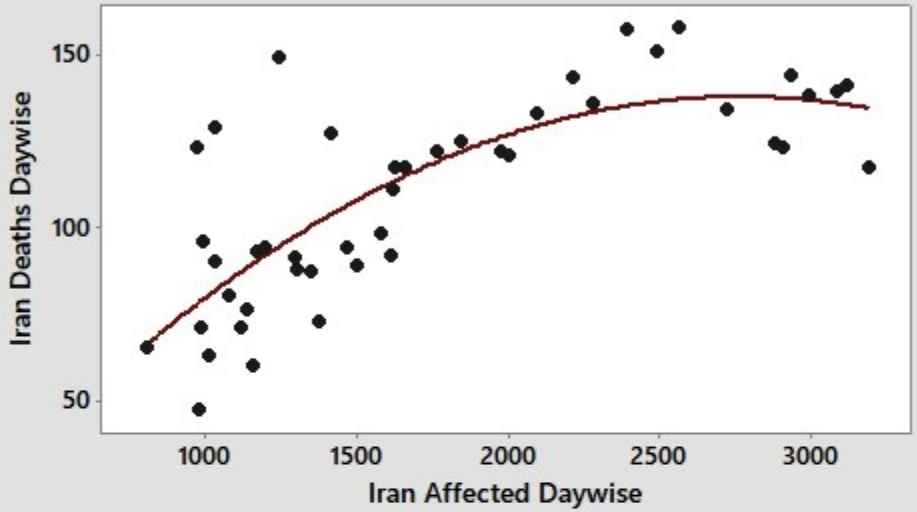
% of variation explained by the model



58.93% of the variation in Iran Deaths Daywise can be explained by the regression model.

Fitted Line Plot for Quadratic Model

Y = - 4.54 + 0.1030 X - 0.000019 X^2



Comments

The fitted equation for the quadratic model that describes the relationship between Y and X is:

Y = - 4.54 + 0.1030 X - 0.000019 X^2

If the model fits the data well, this equation can be used to predict Iran Deaths Daywise for a value of Iran Affected Daywise, or find the settings for Iran Affected Daywise that correspond to a desired value or range of values for Iran Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

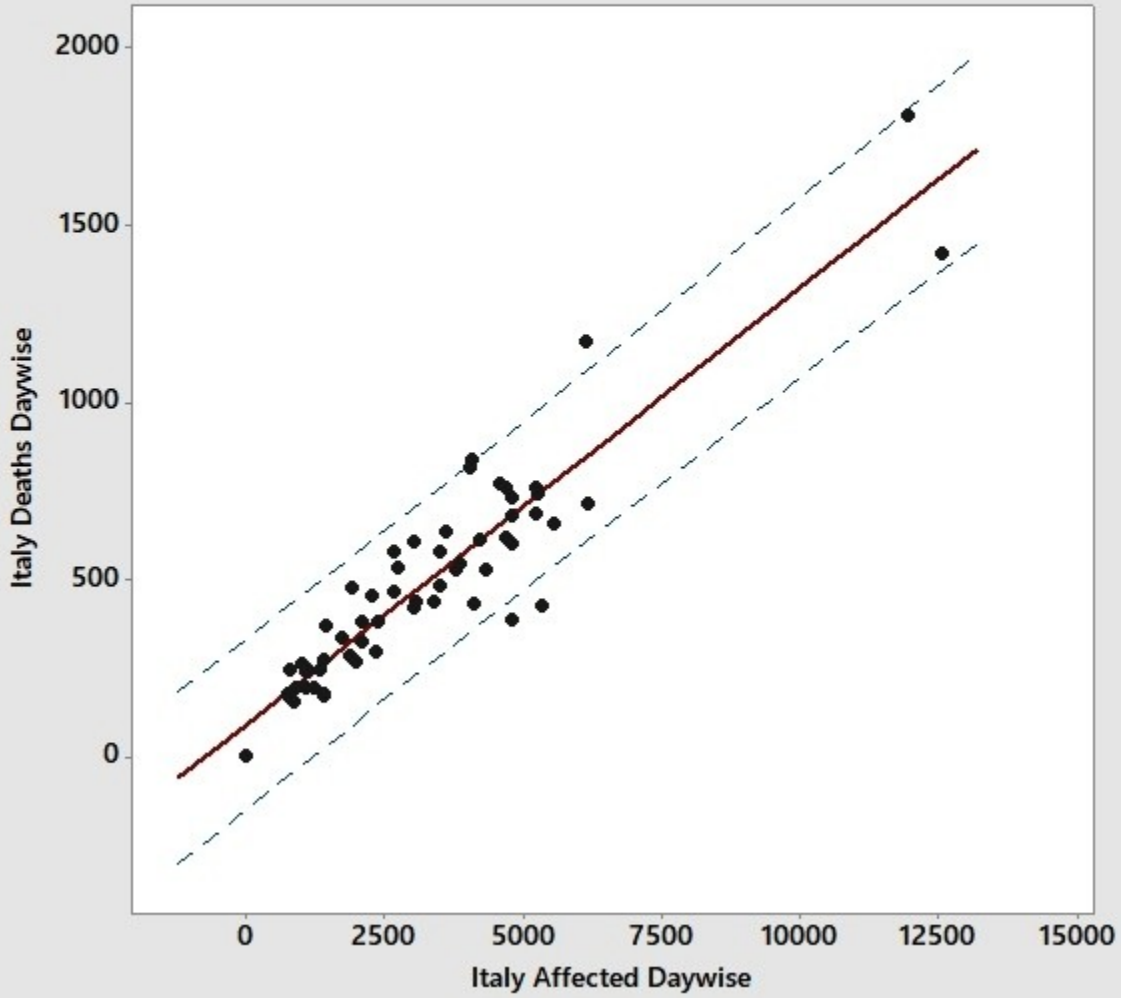
ITALY

Regression for Italy Deaths Daywise vs Italy Affected Daywise
Prediction Report

Y: Italy Deaths Daywise
X: Italy Affected Daywise

Prediction Plot

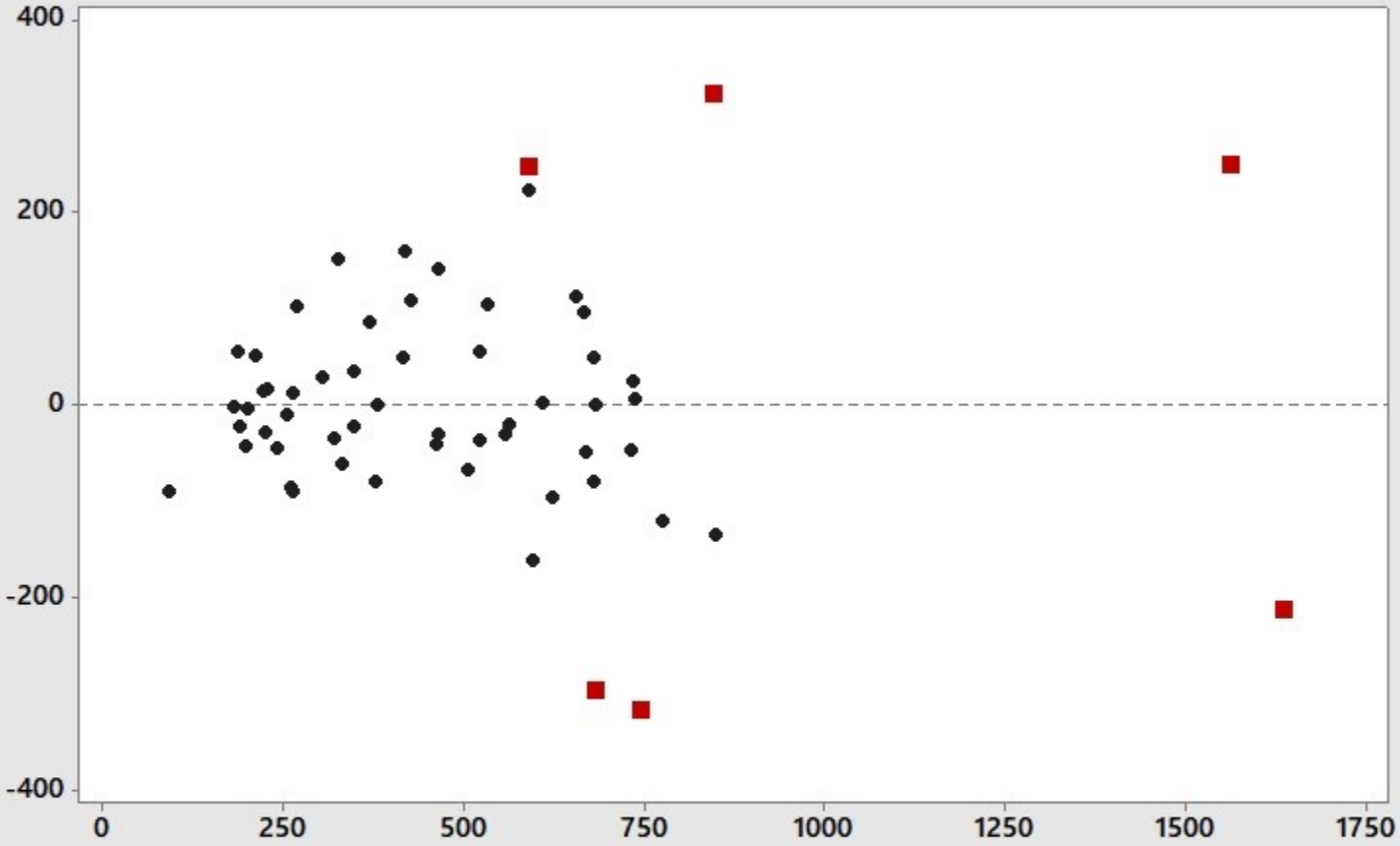
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
-1200	-57.594	(-301.54, 186.36)
-600	16.301	(-225.92, 258.52)
0	90.196	(-150.54, 330.93)
600	164.09	(-75.399, 403.58)
1200	237.99	(-0.50517, 476.48)
1800	311.88	(74.138, 549.62)
2400	385.78	(148.53, 623.02)
3000	459.67	(222.67, 696.67)
3600	533.57	(296.55, 770.58)
4200	607.46	(370.18, 844.74)
4800	681.36	(443.55, 919.16)
5400	755.25	(516.67, 993.83)
6000	829.14	(589.55, 1068.7)
6600	903.04	(662.17, 1143.9)
7200	976.93	(734.56, 1219.3)
7800	1050.8	(806.70, 1295.0)
8400	1124.7	(878.61, 1370.8)
9000	1198.6	(950.30, 1446.9)
9600	1272.5	(1021.8, 1523.3)
10200	1346.4	(1093.0, 1599.8)
10800	1420.3	(1164.0, 1676.6)
11400	1494.2	(1234.9, 1753.5)
12000	1568.1	(1305.5, 1830.7)
12600	1642.0	(1376.0, 1908.0)
13200	1715.9	(1446.3, 1985.5)

Regression for Italy Deaths Daywise vs Italy Affected Daywise
Diagnostic Report

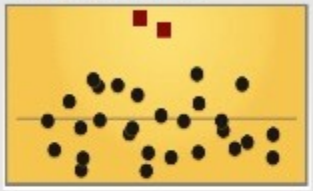
Residuals vs Fitted Values



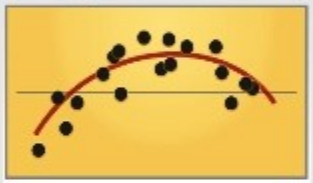
Look for patterns, such as strong curvature or clusters, that may indicate problems with the regression model. Ideally, the points should fall randomly on both sides of zero. Identify any large residuals that could have a strong influence on the fitted line.

Look for these patterns:

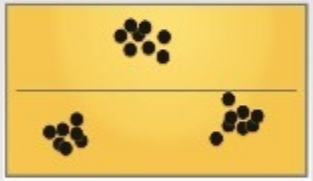
Large Residuals



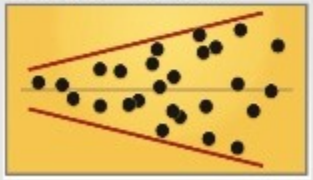
Strong Curvature



Clusters

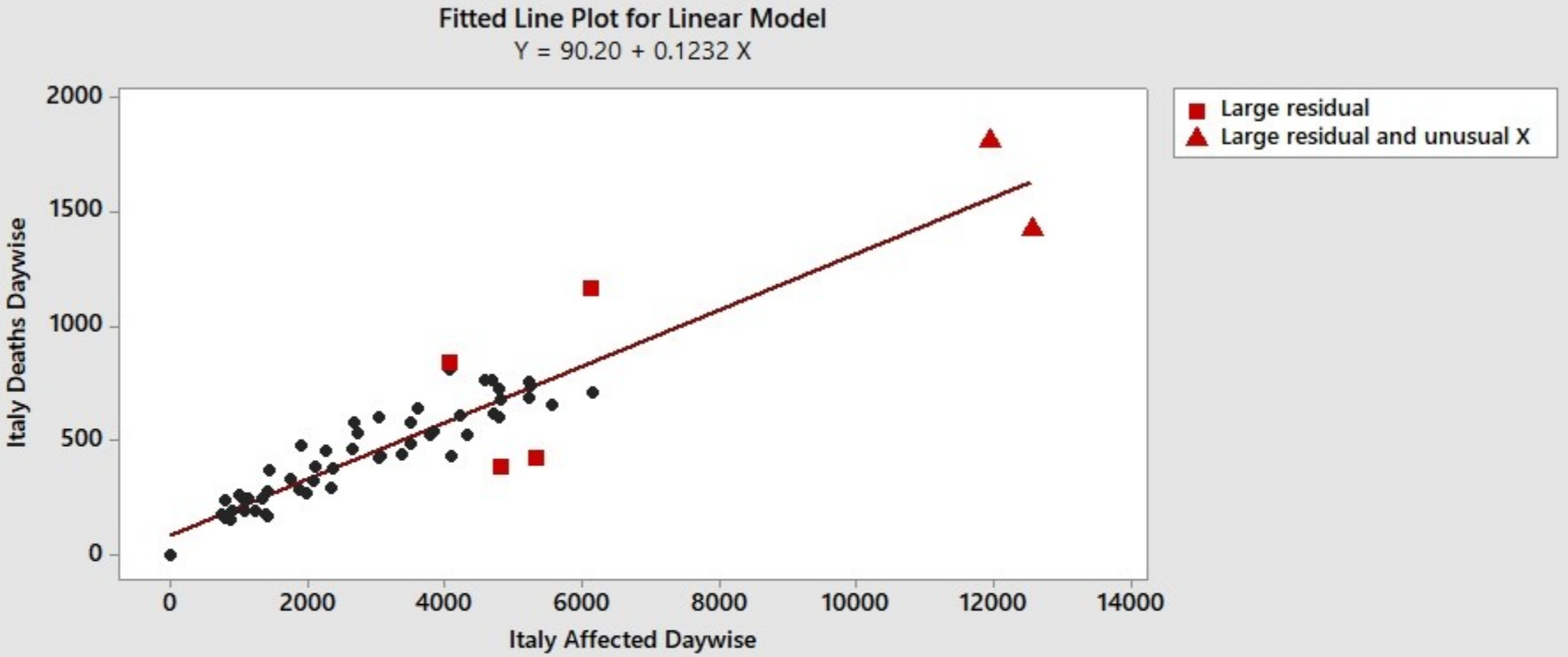


Unequal Variation



Regression for Italy Deaths Daywise vs Italy Affected Daywise
Model Selection Report

Y: Italy Deaths Daywise
X: Italy Affected Daywise



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	85.96%	85.74%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	—	0.776
Residual standard deviation	117.413	118.354

** Statistically significant ($p < 0.05$)*

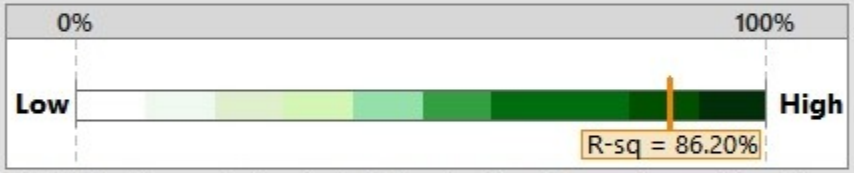
Regression for Italy Deaths Daywise vs Italy Affected Daywise
Summary Report

Y: Italy Deaths Daywise
X: Italy Affected Daywise

Is there a relationship between Y and X?

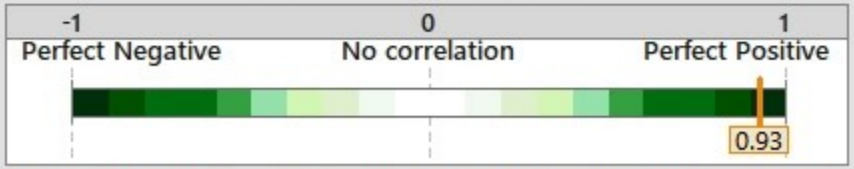
The relationship between Italy Deaths Daywise and Italy Affected Daywise is statistically significant ($p < 0.05$).

% of variation explained by the model



86.20% of the variation in Italy Deaths Daywise can be explained by the regression model.

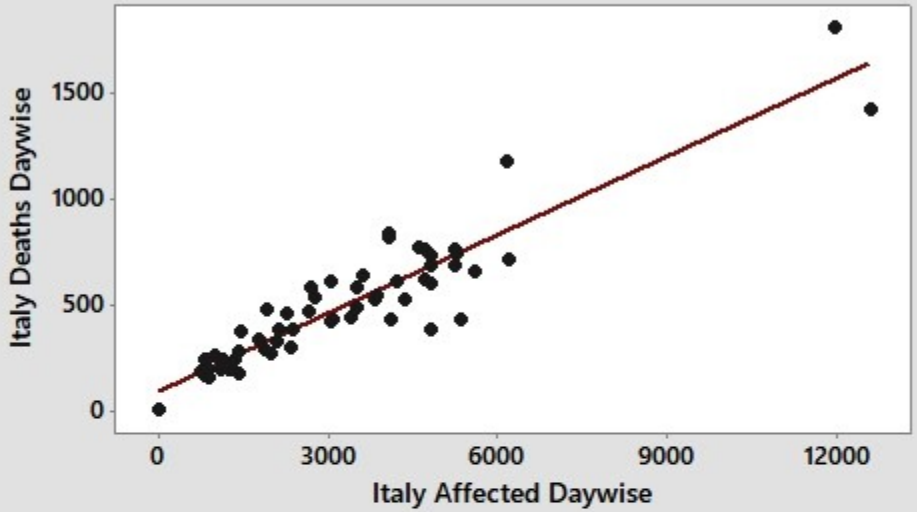
Correlation between Y and X



The positive correlation ($r = 0.93$) indicates that when Italy Affected Daywise increases, Italy Deaths Daywise also tends to increase.

Fitted Line Plot for Linear Model

Y = 90.20 + 0.1232 X



Comments

The fitted equation for the linear model that describes the relationship between Y and X is:

Y = 90.20 + 0.1232 X

If the model fits the data well, this equation can be used to predict Italy Deaths Daywise for a value of Italy Affected Daywise, or find the settings for Italy Affected Daywise that correspond to a desired value or range of values for Italy Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

PAKISTAN

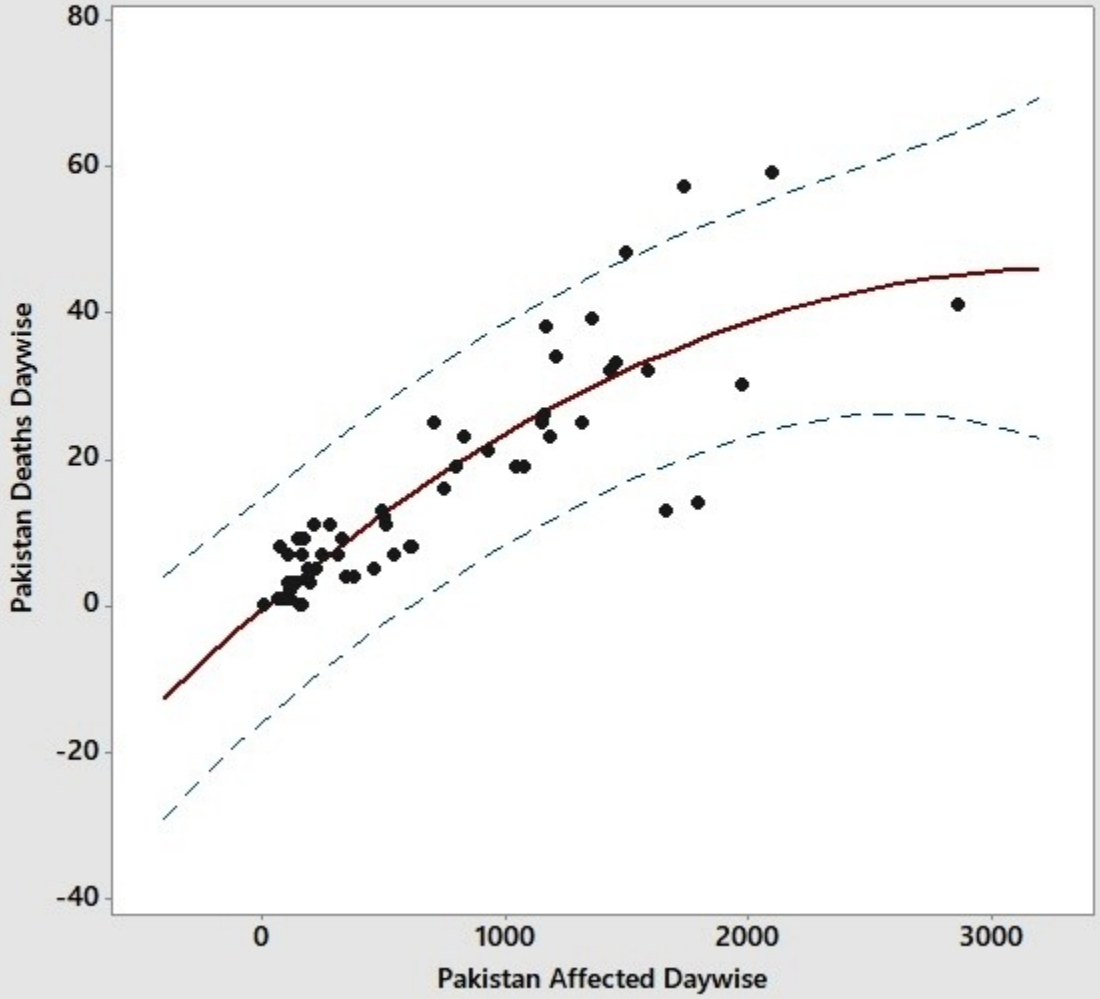
Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise

Prediction Report

Y: Pakistan Deaths Daywise
X: Pakistan Affected Daywise

Prediction Plot

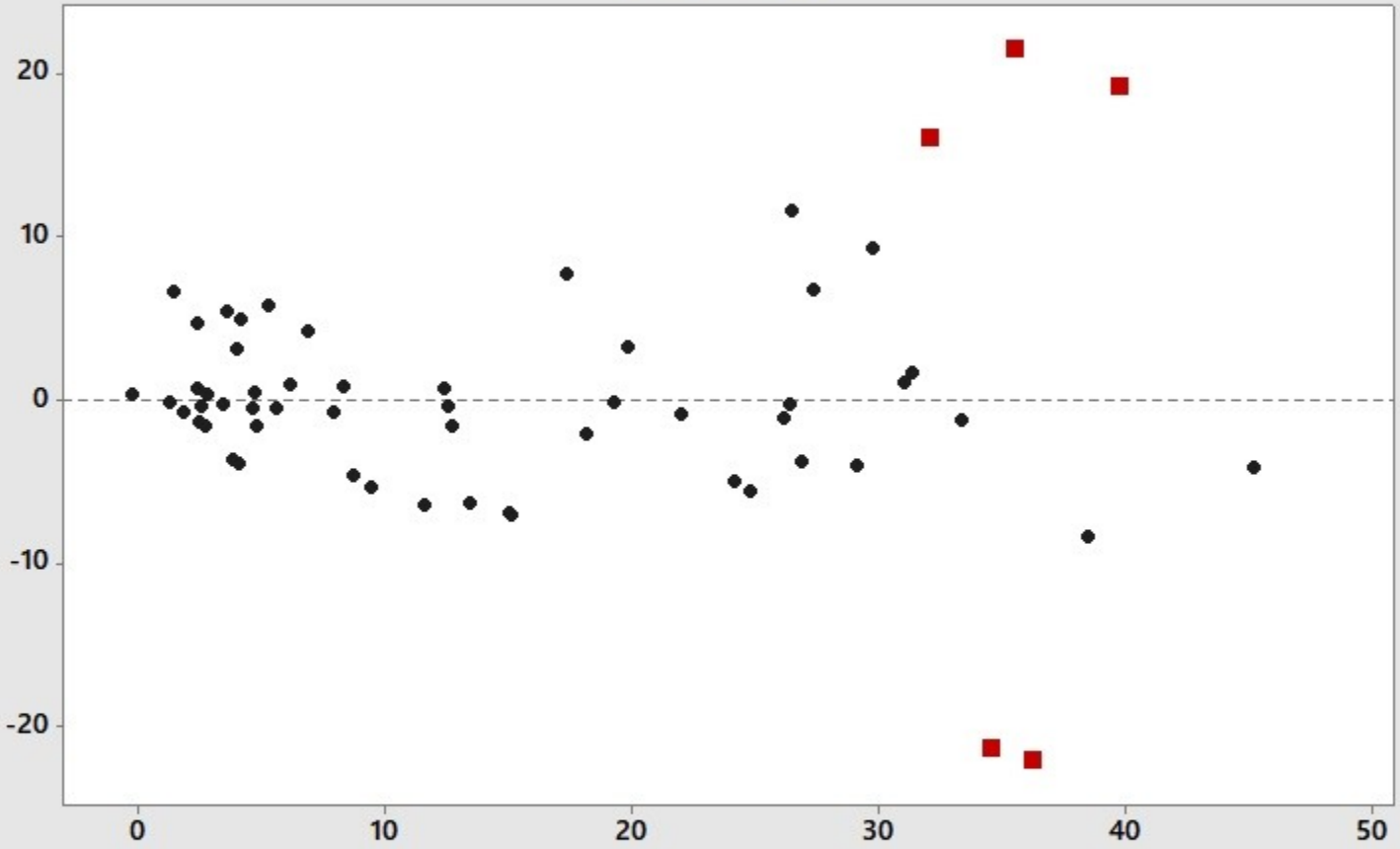
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



X	Predicted Y	95% PI
-400	-12.516	(-29.067, 4.0349)
-250	-7.8797	(-23.815, 8.0559)
-100	-3.4344	(-18.946, 12.077)
50	0.81971	(-14.424, 16.064)
200	4.8827	(-10.216, 19.982)
350	8.7546	(-6.2865, 23.796)
500	12.435	(-2.6049, 27.476)
650	15.925	(0.85423, 30.996)
800	19.224	(4.1104, 34.337)
950	22.331	(7.1769, 37.485)
1100	25.247	(10.061, 40.434)
1250	27.972	(12.763, 43.182)
1400	30.506	(15.278, 45.735)
1550	32.849	(17.595, 48.103)
1700	35.001	(19.698, 50.305)
1850	36.962	(21.562, 52.362)
2000	38.731	(23.160, 54.303)
2150	40.310	(24.460, 56.159)
2300	41.697	(25.430, 57.964)
2450	42.893	(26.035, 59.750)
2600	43.898	(26.248, 61.547)
2750	44.712	(26.045, 63.378)
2900	45.335	(25.411, 65.258)
3050	45.766	(24.335, 67.197)
3200	46.007	(22.817, 69.196)

Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise
Diagnostic Report

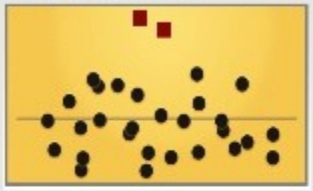
Residuals vs Fitted Values



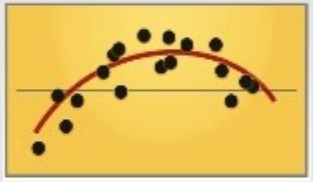
Look for patterns, such as strong curvature or clusters, that may indicate problems with the regression model. Ideally, the points should fall randomly on both sides of zero. Identify any large residuals that could have a strong influence on the fitted line.

Look for these patterns:

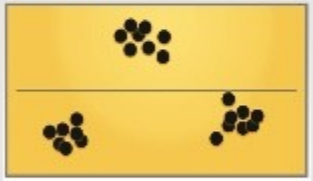
Large Residuals



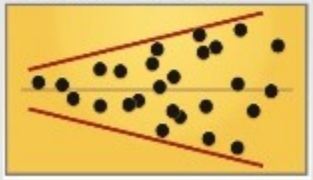
Strong Curvature



Clusters



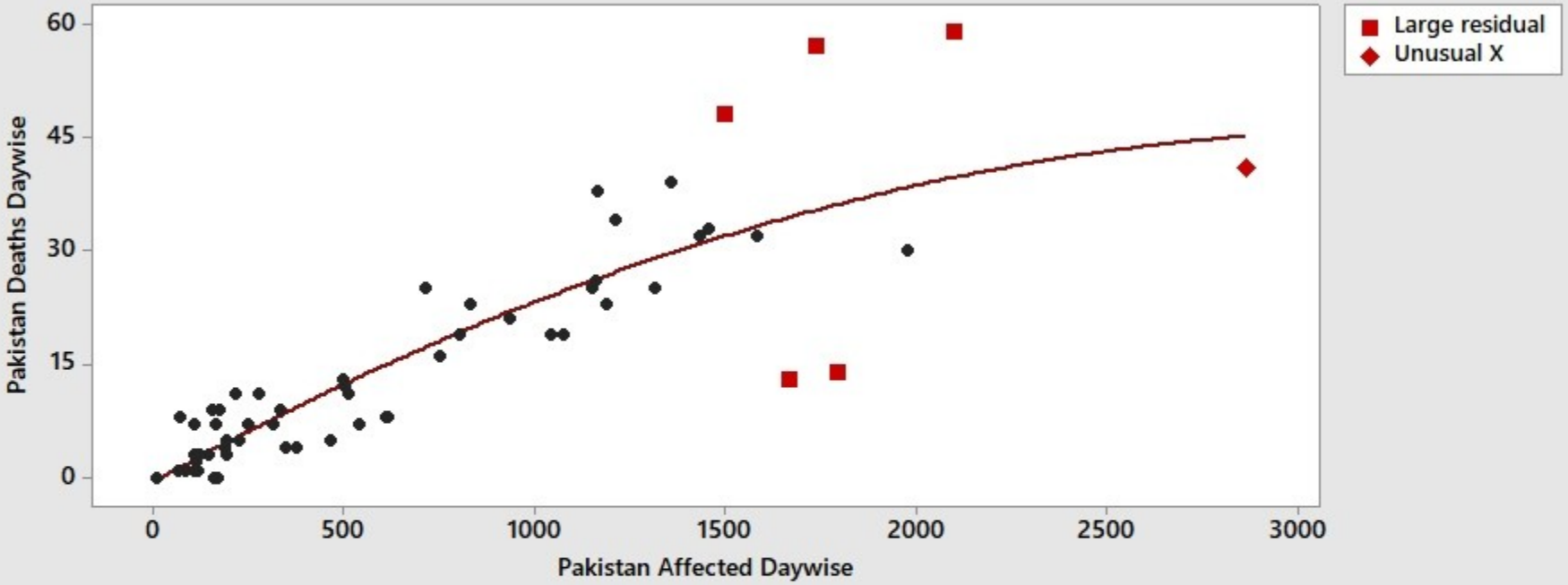
Unequal Variation



Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise
Model Selection Report

Y: Pakistan Deaths Daywise
X: Pakistan Affected Daywise

Fitted Line Plot for Quadratic Model
Y = - 0.577 + 0.02815 X - 0.000004 X^2



Statistics	Selected Model Quadratic	Alternative Model Linear
R-squared (adjusted)	74.23%	72.51%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	0.033*	—
Residual standard deviation	7.421	7.666

** Statistically significant ($p < 0.05$)*

Regression for Pakistan Deaths Daywise vs Pakistan Affected Daywise
Summary Report

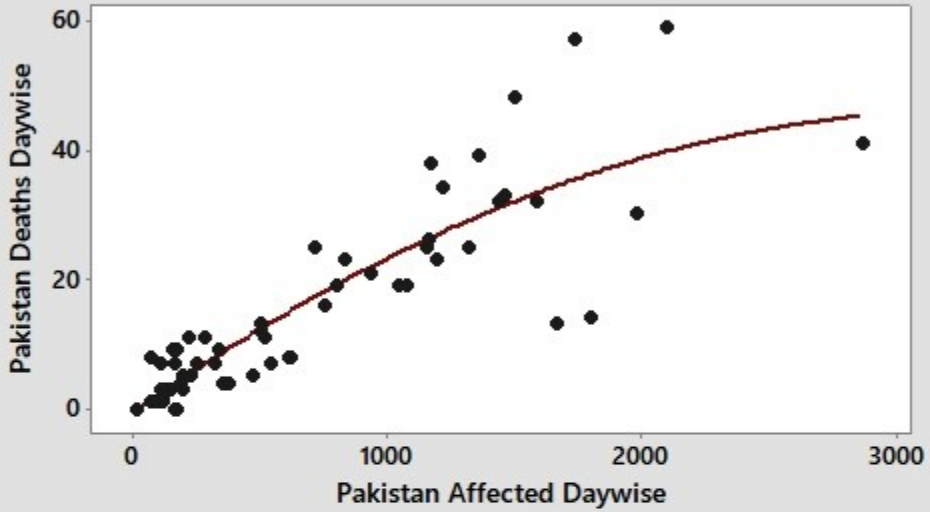
Y: Pakistan Deaths Daywise
X: Pakistan Affected Daywise

Is there a relationship between Y and X?

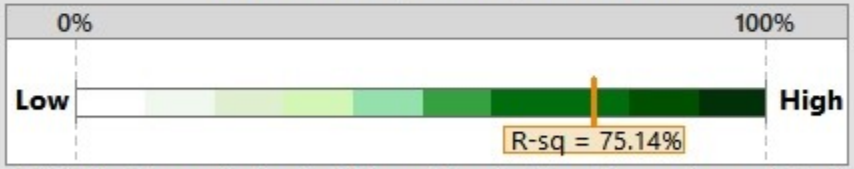
The relationship between Pakistan Deaths Daywise and Pakistan Affected Daywise is statistically significant (p < 0.05).

Fitted Line Plot for Quadratic Model

Y = - 0.577 + 0.02815 X - 0.000004 X^2



% of variation explained by the model



75.14% of the variation in Pakistan Deaths Daywise can be explained by the regression model.

Comments

The fitted equation for the quadratic model that describes the relationship between Y and X is:

Y = - 0.577 + 0.02815 X - 0.000004 X^2

If the model fits the data well, this equation can be used to predict Pakistan Deaths Daywise for a value of Pakistan Affected Daywise, or find the settings for Pakistan Affected Daywise that correspond to a desired value or range of values for Pakistan Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

SPAIN

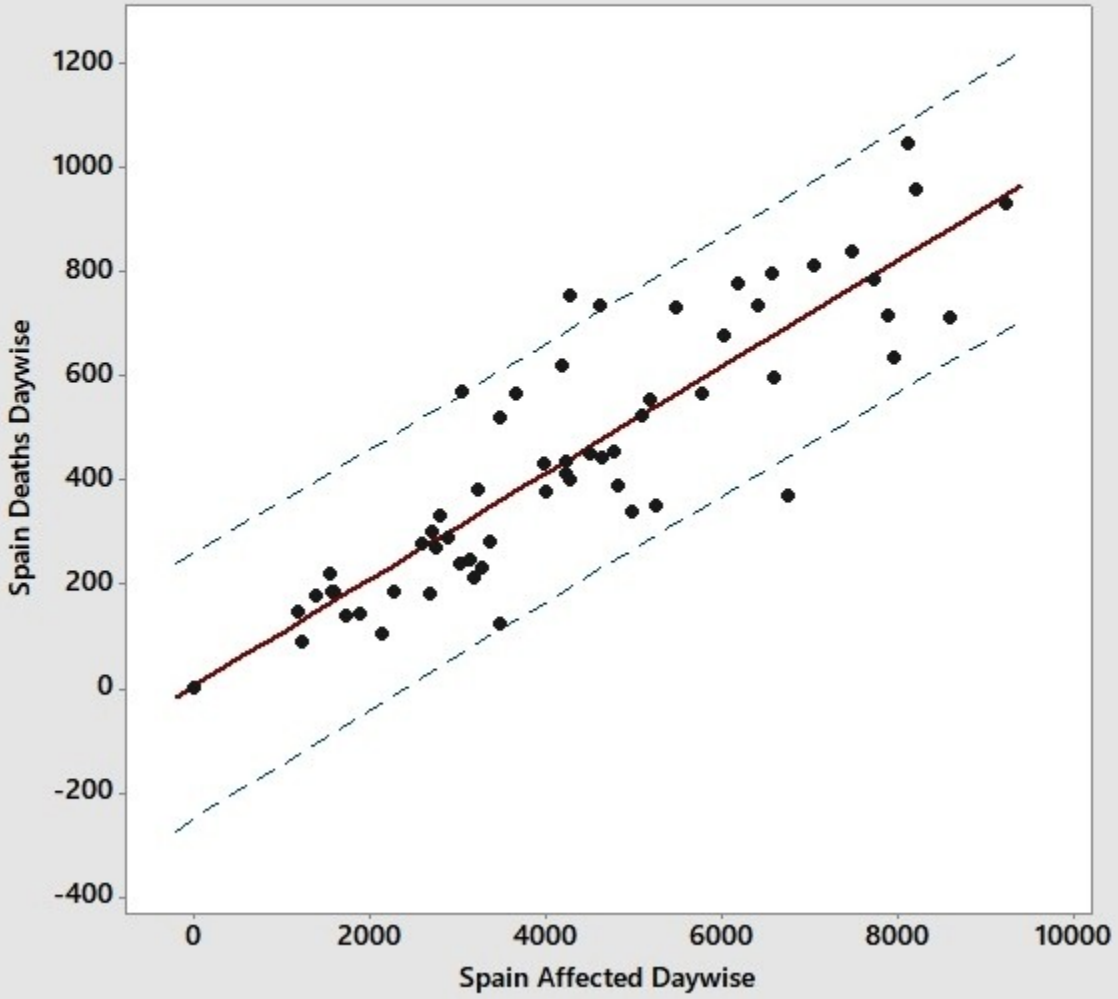
Regression for Spain Deaths Daywise vs Spain Affected Daywise

Prediction Report

Y: Spain Deaths Daywise
X: Spain Affected Daywise

Prediction Plot

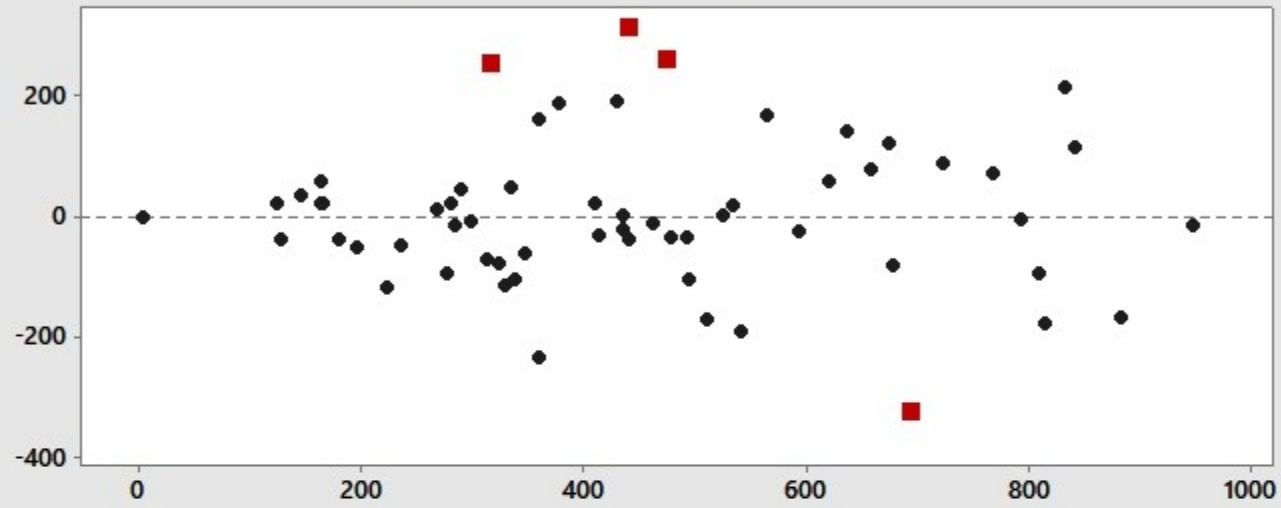
The red fitted line shows the predicted Y for any X value. The blue dashed lines show the 95% prediction interval.



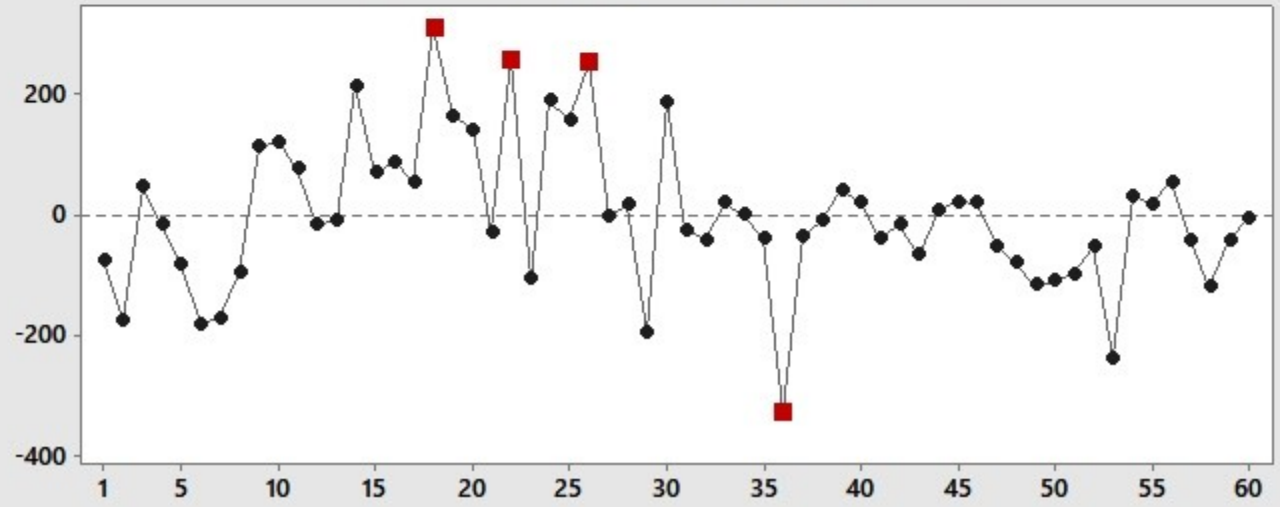
X	Predicted Y	95% PI
-200	-16.097	(-272.56, 240.36)
200	24.758	(-230.23, 279.74)
600	65.614	(-188.03, 319.25)
1000	106.47	(-145.95, 358.89)
1400	147.32	(-104.02, 398.67)
1800	188.18	(-62.212, 438.57)
2200	229.04	(-20.543, 478.61)
2600	269.89	(20.988, 518.79)
3000	310.75	(62.381, 559.11)
3400	351.60	(103.64, 599.57)
3800	392.46	(144.75, 640.16)
4200	433.31	(185.72, 680.90)
4600	474.17	(226.56, 721.78)
5000	515.02	(267.25, 762.79)
5400	555.88	(307.81, 803.95)
5800	596.73	(348.22, 845.25)
6200	637.59	(388.50, 886.68)
6600	678.45	(428.63, 928.26)
7000	719.30	(468.63, 969.97)
7400	760.16	(508.50, 1011.8)
7800	801.01	(548.23, 1053.8)
8200	841.87	(587.83, 1095.9)
8600	882.72	(627.30, 1138.1)
9000	923.58	(666.64, 1180.5)
9400	964.43	(705.86, 1223.0)

Regression for Spain Deaths Daywise vs Spain Affected Daywise
Diagnostic Report

Residuals vs Fitted Values
Look for nonrandom patterns and large residuals.

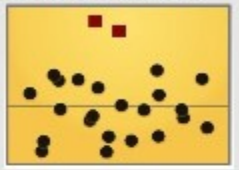


Residuals vs Observation Order
Look for nonrandom patterns and large residuals.



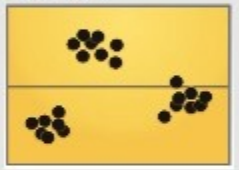
Look for these patterns:

Large Residuals

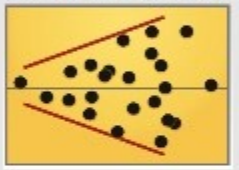


Strong Curvature

Clusters



Unequal Variation



Large Residuals

Cyclical

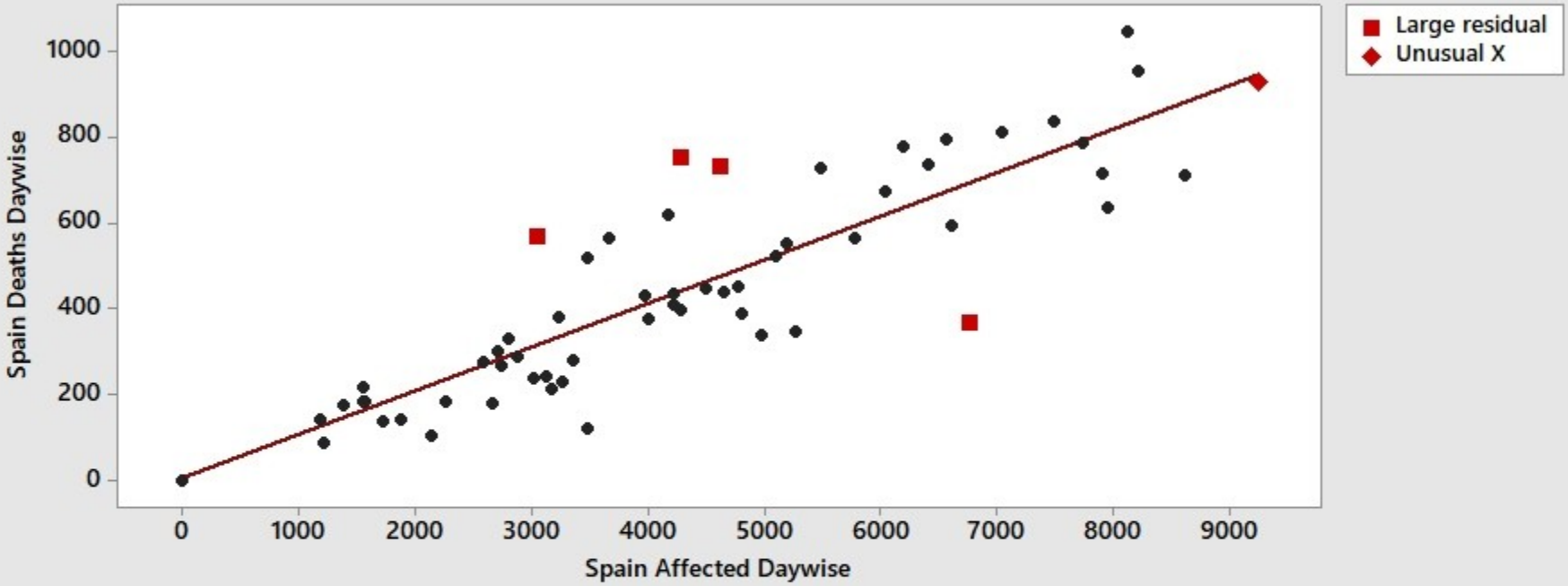
Trend

Shifts

Regression for Spain Deaths Daywise vs Spain Affected Daywise
Model Selection Report

Y: Spain Deaths Daywise
X: Spain Affected Daywise

Fitted Line Plot for Linear Model
Y = 4.33 + 0.1021 X



Statistics	Selected Model Linear	Alternative Model Quadratic
R-squared (adjusted)	76.44%	76.17%
P-value, model	<0.005*	<0.005*
P-value, linear term	<0.005*	<0.005*
P-value, quadratic term	—	0.557
Residual standard deviation	122.665	123.360

** Statistically significant (p < 0.05)*

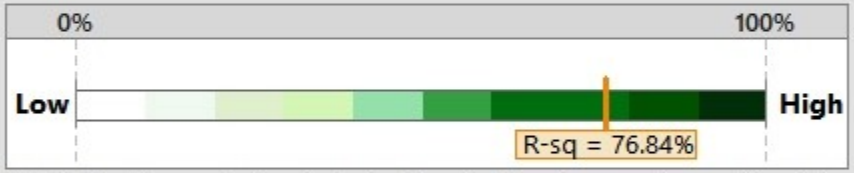
Regression for Spain Deaths Daywise vs Spain Affected Daywise
Summary Report

Y: Spain Deaths Daywise
X: Spain Affected Daywise

Is there a relationship between Y and X?

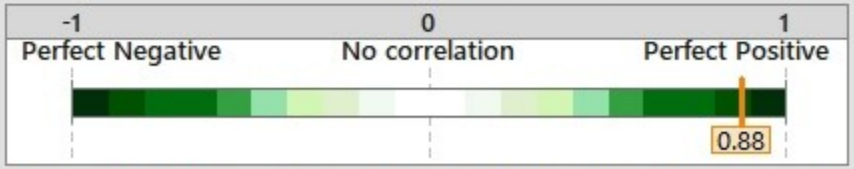
The relationship between Spain Deaths Daywise and Spain Affected Daywise is statistically significant ($p < 0.05$).

% of variation explained by the model



76.84% of the variation in Spain Deaths Daywise can be explained by the regression model.

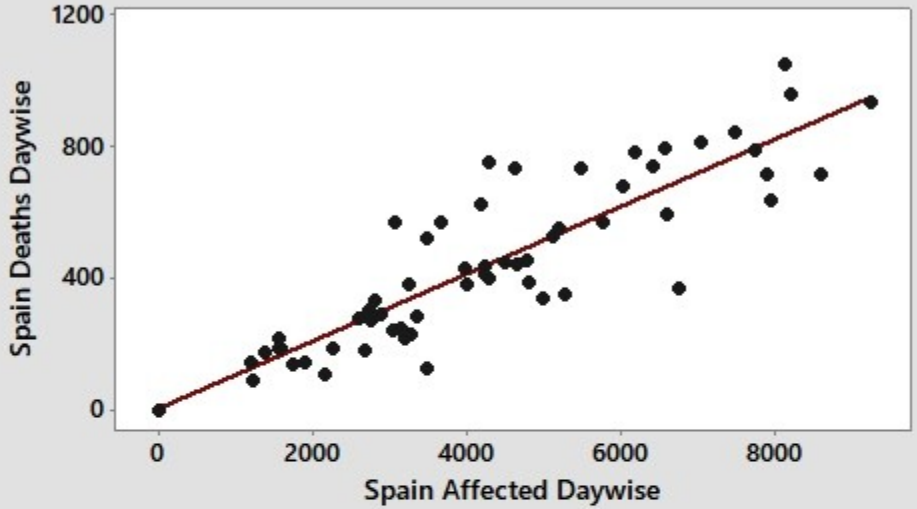
Correlation between Y and X



The positive correlation ($r = 0.88$) indicates that when Spain Affected Daywise increases, Spain Deaths Daywise also tends to increase.

Fitted Line Plot for Linear Model

Y = 4.33 + 0.1021 X



Comments

The fitted equation for the linear model that describes the relationship between Y and X is:

Y = 4.33 + 0.1021 X

If the model fits the data well, this equation can be used to predict Spain Deaths Daywise for a value of Spain Affected Daywise, or find the settings for Spain Affected Daywise that correspond to a desired value or range of values for Spain Deaths Daywise.

A statistically significant relationship does not imply that X causes Y.

Inferential Statistics on COVID-19

Understanding to the Level of Correlation

r – count score	Level of Correlation
0.00 to 0.199	Very Low Correlation
0.20 to 0.399	Low Correlation
0.40 to 0.599	Moderate Correlation
0.60 to 0.799	Strong Correlation
0.80 to 1.00	Very Strong Correlation

Source: Sugiyono, 2013

Inferential Statistics on COVID-19

All the data of these following countries have been proved that there is a direct relationship with the rate of corona affected patients and the rate of death by corona attack is in Positive Correlation.
Global correlation is 0.679 (Pearson Correlation - r)

Name of the Country	Pearson Correlation (r)
India	0.937
Italy	0.928
Spain	0.877
Pakistan	0.854
China	0.729
Iran	0.719
America	0.661
France	0.541
England	0.499

Regression Analysis of Corona Attack COVID-19

- The regression equation can be applied to any regression line. It is represented by:
- Y = a + bx
- To predict the value y (value on the vertical axis of the graph) from the value x (on the horizontal axis), b is the regression coefficient and *a* is the constant
- The regression coefficient and constant can be given with their “stand errors”. These indicate the accuracy that can be given to the calculation. No one can worry about the actual value of these but look at their *p* values. The lower the *p* value, the greater the

Conclusion

- There is a significant positive relationship exists between the rate of the corona affected patients and the rate of death patients by corona attack.

THANK YOU